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The relationship of individual differences to two instructional approaches in a college reading-study skills course.

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THE RELATIONSHIP OF INDIVIDUAL DIFFERENCES TO TWO INSTRUCTIONAL APPROACHES IN A COLLEGE READING-STUDY SKILLS COURSE

A Dissertation Presented

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CHAPTER I

STATEMENT OF THE PROBLEM

Introduction

College reading-study skills (CRSS) programs have become rather widespread since 1894 when Abell, at Wellesley College, made the first attempt to help college students read more effectively (Leedy, 1958). Several published surveys illustrate the growth of CRSS programs. For example, Triggs (1942), in a study conducted in the fall of 1942, reported 258 programs in operation. Blake's (1955) survey conducted in 1953 reported that over 90% of colleges in the United States offered some kind of study-skills course. In the late 1960's Geerlofs and Kling (1968) reported that at least 210 colleges had reading-study skills programs, and Lowe (1970) found that 70% of the institutions of higher learning in Florida had programs. Recently, Hayward (1971) reported that 53% of Canadian colleges responding to her survey offered some form of reading instruction.

As programs developed and expanded, CRSS instructors recognized the need to evaluate their courses and to find the best method of teaching them. The many evaluations of programs, however, yielded inconsistent results, and the limited number of studies comparing instructional methods illustrated that no single best method of teaching a CRSS course has been identified. An important implication of the comparative studies is that, while no significant differences were found between methods of teaching groups, some individuals, because of their particular

skills and deficiencies as well as their personalities, may respond to one type of instruction better than to the other.

Purpose of the Study

The major purpose of this study is to relate individual differences among selected Suffolk University freshmen to their ability to succeed academically through a reading-study skills course which utilizes (1) a teacher-directed approach and (2) a student-directed approach. The identification of isolated variables which differentially interact with the two instructional strategies would thus make it possible for the reading instructor at Suffolk University to prescribe the appropriate instructional method for each freshman enrolled in the reading-study skills course.

A related purpose of the study is to evaluate the overall effectiveness of the Suffolk University reading-study skills program.

Review of the Literature

Teacher-Directed Programs

In a recent discussion of CRSS programs, Maxwell (1971) noted that evaluation of such programs is essential for making decisions concerning how the program might be improved, how instructors should be selected and trained, how materials and methods are to be selected, whether a service should be expanded or contracted, or how the program's existence can be justified to budget committees. Prior to 1920, little quantitative evaluation took place because of the lack of standardized tests and sophisticated

research techniques. One of the earliest evaluative studies was conducted in 1929 by Parr who reported "evidence" that students participating in reading programs improved their reading skills and did better college work (Lowe, 1971).

Entwistle (1960) reviewed reports of progress of 22 CRSS programs operating between the mid 30's and the late 50's. With the exception of two "rather specialized studies," one of the criteria used to determine the effectiveness of the courses was overall scholastic average. Entwistle concluded that, in general, some kind of improvement seemed to be the rule, the modal gain being about half a letter grade. She warned, however, that "overall judgment about the benefit accruing from these courses needs to be tempered somewhat, in spite of the uniformly positive results, by awareness that negative results are much less apt to be published than positive results [pp. 248-250]."

Reed (1956) was very critical of many of the same studies discussed by Entwistle. He felt that errors in methodological design and misuse of statistical techniques imposed serious limitations on the generalizations that could be drawn from studies such as those completed by Kilby (1945), McGinnis (1951), Barbe (1952), and Mouly (1952). According to Reed, the most serious weaknesses were failure to equate the experimental and control groups on the basis of initial motivation (volunteers were paired with non-volunteers) and the failure to randomize the participants. Researchers then proceeded to test gains by using statistics based on statistical theory which assumed the randomization of subjects.

Robinson (1950) also sharply criticized evaluators of CRSS programs for their failure to control for motivation.

> Initial attitudes and motivations are entirely disregarded; a singular omission and one which becomes all the more striking when it is remembered that most remedial classes are conducted on a voluntary basis, or at best have only partial academic credit. When students choose freely to present themselves for remediation, or are allowed a degree of choice in selection, the function of personality factors cannot in reason be denied. With a certain logic one could theorize, for example, that under those conditions reading course registrants might be overweighted with highly motivated individuals--the undergraduate 'eager beavers'--whose eventual performance gain would be associated, at least in part, with the qualities and traits which caused the selection of the course in the first place [p. 887].

Robinson then described his study in which he controlled for motivation by forming a control group comprised of students who volunteered for the course but were unable to attend classes "through force of circumstance." Differences between the experimental and control groups appeared closely at the 10% level of confidence which led Robinson to conclude that, to that extent, participation in a reading-study skills program is meaningfully associated with higher grade point average (GPA).

Considering Reed's criticisms of earlier studies, McDonald (1957) reported a study in which he both controlled for motivation and assigned subjects randomly to the experimental and control groups. The study showed that the experimental group significantly exceeded the control group in first semester grade point average, as well as in cumulative grade point average for two and three semesters following the course.

In recent years studies using GPA as the criterion for evaluating CRSS programs have yielded inconsistent results. Some studies purported to demonstrate a significant positive relationship between enrollment in a CRSS course and improvement in GPA (Belcher, 1971; Dalton et al., 1965; Hafner, 1966;

Hultgren and Crew, 1969; Kelly and Mech, 1968; Lesnick, 1970; Pauk, 1965; Payne, 1971; Stebens, 1968; Wade, 1967; Wendel, 1965), while others purported to show no relationship between the two (Bahe, 1969; Colvin, 1968; Durkee, 1968; Griffin, 1968; Gunderson, 1960; Keetz, 1968; King et al., 1969; Losak, 1970; Regensberg, 1966; Sosebee, 1963; Swindle, 1968; Wilson, 1968).

Several of the researchers (Belcher, 1971; Dalton et al., 1965; Gunderson, 1960; Hafner, 1966; Kelly and Mech, 1968; Lesnik, 1970; Pauk, 1965; Stebens, 1968) ignored the major criticism made by Reed (1956) and Robinson (1950) and failed to control for student motivation; that is, they compared volunteers for a CRSS course with non-volunteers.

Gunderson (1960), for example, found that students enrolled in reading at Concordia College made significantly higher grades than non-enrollees in English, religion and chemistry. However, she had found it impossible to assign students randomly into the reading classes and her study compared students who volunteered for reading instruction with students who did not volunteer.

Dalton et al. (1965) found that freshmen who volunteered for reading at the University of Missouri had a significantly higher (.01 level) mean GPA than either a study skills group or a control group who did not volunteer at the end of the semester in which the experiment was conducted as well as the following two semesters. The groups were equated on the basis of scores on the verbal and mathematics sections of the Scholastic Aptitude Test and reading comprehension.

Although Pauk's (1965) Cornell University students were carefully matched on sex, year in school, college within the University,

and total score on the Scholastic Aptitude Test, he did not control for motivation in his two studies. In one of the studies which included 61 matched pairs, the experimental group received 50-minute study-skills lectures twice a week for three consecutive weeks. The control group received no such instruction. The experimental group made a statistically significant mean GPA increase (.01 level) from first to second semester over the control group. In the other study, 153 pairs of students were matched. The experimental group received instruction in both reading and study skills twice weekly for 50 minutes for seven consecutive weeks. The experimental group made a statistically significant (.05 level) mean increase in GPA from first to second semester over the control group which had received no instruction in reading-study skills.

Hafner's (1966) experimental subjects consisted of 35 students who volunteered to enroll in a CRSS course at Southern Illinois University. The control group was comprised of 35 students who were not enrolled. The students were matched only on initial GPA and year in school. Hafner found that while neither the experimental nor the control group made a significant gain in overall GPA, a statistically significant (.05 level) larger number of the experimental students than control students attained above a "C" average in the quarter following instruction.

Kelly and Mech (1968) compared 23 Washington State University freshman volunteers for a CRSS program with 23 who did not volunteer for the program. Students were matched on predicted GPA from the Washington Pre-College Test and first semester grades. There was no control for reading ability. Two semesters after

completion of the instructional program, experimental subjects majoring in elementary education and science-mathematics showed a statistically significant difference in cumulative GPA means over students in the control group with the same majors. There were no significant differences for students majoring in social studies and literature.

Stebens (1968) was concerned with the evaluation of a CRSS program which appeared to be of a volunteer nature. The experimental group was comprised of 108 entering freshmen at Oklahoma State University. A control group consided of 108 entering freshmen in the same class who did not participate in the program. The groups were equated on the basis of scholastic aptitude as measured by the American College Test, reading ability as measured by the Nelson-Denny Reading Test, and sex. Stebens concluded that participation in the CRSS program resulted in significant improvement (.05 level) in overall academic improvement.

Lesnik (1970) found that 35 students who volunteered for individual study-skills counseling sessions at the University of Pennsylvania attained statistically significant better grades than a control group at the end of freshman year, at the end of senior year, and on overall GPA averages. The experimental and control groups were comparable only to the extent that students in both groups scored at the 25th percentile or below on the Preston-Botel Study Habits Checklist.

Belcher (1971) studied the Pacific Lutheran University "Development of Reading Skills" and "Study Skills" courses. Thirty full-time undergraduates volunteered for the former course and 11 volunteered for the latter. The control group consisted of 314

students who took neither course. Belcher found that only students enrolled in the "Study Skills" course attained spring semester GPA's significantly higher (.05 level) than their fall semester GPA's. These students, however, had a significantly lower Fall GPA than both the "Reading Skills" group and the control group, as well as a significantly lower GPA in the spring semester. Belcher failed to control for motivation, and neither assigned subjects randomly to groups nor matched them on any variables.

In other studies of "successful" CRSS programs, the researchers (Hultgren and Crew, 1969; Payne, 1971; Wade, 1967; Wendel, 1965) attempted to control for motivation by requiring students to enroll in the CRSS program and comparing them to a group of students for whom enrollment was not made mandatory.

Payne's (1971) experimental group consisted of 160 college freshmen at Northwestern State University who were required to enroll in the CRSS program. No information was presented on the number and composition of the control group or on whether the groups were equated. Payne concluded that experimental subjects demonstrated significantly higher overall academic achievement than the control group at the end of the first semester. The difference, however, was not significant for the next four semesters.

In studies conducted by Wade (1967) and Hultgren and Crew (1969), the researchers concluded that their programs were successful, but the conclusions were drawn from poorly designed studies. Wade's conclusions were based on the fact that 67% of the students who were required to enroll in the CRSS program at Lincoln Junior College improved their grades, while only 58% not enrolled did so. Experimental and control groups were not

systematically formed and the statistical significance of the differences in percentages is not reported.

A special, required CRSS program for freshman athletes at the University of Minnesota was described and evaluated by Hultgren and Crew (1969). After the program had been in operation for three years, the authors found that over three-fourths of those who participated in the program exceeded the predicted end-of-year GPA. As a group, the participants exceeded the mean GPA for all male freshmen in the University by approximately one-half grade level, but no test of statistical significance was reported. The authors did not systematically form the experimental and control groups and two entirely different populations were compared. In addition, whatever success was accrued from the program may have been due to the special subject matter tutoring and counseling program that was given to the athletes in addition to their regular CRSS program.

Wendel (1965) reported on a unique CRSS program at Wagner College in which students in an experimental group received 30 hours of reading-study skills instruction from faculty chosen from various academic departments. The control group received no such instruction. Both experimental and control subjects were students who had scored in the lowest quartile (between 326 and 441) on the verbal section of the Scholastic Aptitude Test. Twenty-two students in the experimental section were required to enroll in the CRSS class. While there were no differences in the mean GPA of the groups at the end of the first college term, significant differences (.05 level) did appear after two semesters, with the mean GPA of the experimental group higher than that of

the control group.

To summarize, some researchers have concluded that there is a positive relationship between participation in a CRSS program and GPA. But a critical review of the studies indicate that such a conclusion may be unwarranted since most of the researchers either failed to control for initial motivation of volunteers to the programs or utilized a poor research design.

There are, on the other hand, many researchers (Bahe, 1969; Colvin, 1968; Durkee, 1968; Griffin, 1968; Keetz, 1968; King et al., 1969; Losak, 1970; Regensberg, 1966; Sosebee, 1963; Swindle, 1968; Wilson, 1968) who concluded that there is no positive relationship between participation in a CRSS program and GPA. In several of these studies (Bahe, 1969; Griffin, 1968; King et al., 1969; Sosebee, 1963; Swindle, 1968; Wilson, 1968) even volunteer programs failed to produce any academic payoff for its participants.

Sosebee (1963) conducted a four-year follow-up study of 200 Indiana University students matched on general intelligence test scores and reading test scores. One hundred freshman volunteers to the CRSS program comprised the experimental group and 100 non-volunteers from the same class comprised the control group. Although experimental students evaluated the course favorably, no statistical difference was found at the close of the first semester or during any of the semesters until graduation.

Griffin (1968) studied the effects of a special volunteer summer reading-study skills course for first-year junior college students. There were two control groups: one participated in no pre-college program; the other participated in summer session,

but not in the special course. There is no indication as to how, or if, the experimental and control groups were matched. At the end of two semesters following the program, it was found that the special summer program did not significantly affect the GPA of participants.

Swindle (1968) matched an experimental group of male students who volunteered for the Texas A & M "Techniques of Learning" course with a control group on the basis of scores on the Scholastic Aptitude Test. He found that military students who did not pursue the course attained a higher overall GPA than their counterparts. When all students were considered, there was no significant difference between the groups. The attrition rate was significantly lower for course participants, but this may have been due to the motivation factor.

Three other volunteer programs were evaluated by Wilson (1968), King et al. (1969), and Bahe (1969). Wilson's (1968) experimental group was composed of students who entered the University of Mississippi in 1963, 1964, and 1965 and who completed a course in "Effective Study" during their freshman year. The control group was composed of students who entered the University as freshmen during the same years as the experimental group but chose not to enroll in the course. Students in each group were matched on the basis of the American College Test, matriculation date, sex, and age. It was found that over a two-year period, students who took the study-skills course did not achieve a higher GPA than those who had not taken the course.

King et al. (1969) obtained data on an experimental group of 115 graduate and undergraduate students at the University of

Missouri who were matched with a control group on sex, year in college, level of scholastic achievement, and college of enrollment. The experimental group volunteered for a 20-hour CRSS program. The post-semester GPA was not significantly different from the pre-semester GPA for either the experimental or control group. However, students in the experimental group with initial reading rates between 200 and 250 words per minute had a statistically significant increase in GPA. But this sub-group was not compared with a similar sub-group in the control group.

It should be mentioned that when a sample includes graduate students, GPA, because of the ceiling factor, is not an appropriate criterion to measure the effectiveness of a CRSS program. Most graduate schools require students to maintain a minimum average of "B" (3.0). It is very likely that graduate students in this study had an academic average between 3.0 and 4.0 before enrolling in the course. The authors did point out that, before enrolling in the course, some of the students had already maintained a 4.0 average. In such cases it is impossible for students to show progress when GPA is the criterion.

Bahe's (1969) sample consisted of freshmen with "high learning potential" but who were "underachievers." Experimental and control subjects had graduated in the upper 30% of their high school class, attained a composite American College Test score of 23 or higher, and attained a GPA of below "C" during their first semester at the University of Wisconsin-Milwaukee. Two experiments were conducted. The first, begun in the summer of 1965, included 33 experimental volunteers from 123 eligible freshmen. The second, conducted in

1966, included 20 volunteers from a total of 118 who were eligible. The control group was comprised of students who were eligible for the course but declined the offer to enroll in it. The groups were statistically equivalent in high school rank, American College Test scores, and freshman GPA. After a two-semester follow-up in the first experiment and a one-semester follow-up in the second experiment, Bahe found that the academic performance of the experimental subjects was inferior to that of the control subjects, but not at a statistically significant level.

Some researchers controlled for motivation either by forming a control group with students who wished to enroll in a CRSS program and were denied admission, or by forming a control group with students who normally would have been required to enroll in the CRSS program but were precluded from doing so for research purposes. Regensberg (1966) and Durkee (1967) conducted studies in the former category and Colvin (1968), Keetz (1968) and Losak (1970) conducted studies in the latter category.

Regensberg (1966) divided Glassboro State College freshmen into two experimental groups who had volunteered to enroll in a CRSS program and two control groups, one of which was composed of students who wished to enroll but were denied admission, and the other composed of students who had been notified of their reading deficiencies but chose not to enroll. The groups were matched on the basis of sex, age, intelligence quotient, total reading scores, and high school graduation rank. Regensberg analyzed GPA's of the semester in which the course was taught and found no significant differences in GPA of the experimental and control groups.

Durkee (1967) studied the effectiveness of a ten-hour study

skills course for freshmen on academic probation at the University of Southern Mississippi. Three groups who met "selective criteria" were formed by random assignment of students to one of the following: group "A" who received no contact, treatment, or testing; group "B" who volunteered for the course but received only pre-experimental and post-experimental testing; and group "C" who attended the study-skills class. Seventy-one students participated in the study. The characteristics of the experimental group "seemed to be similar" to the control groups as measured by the American College Test and the Otis Quick-Scoring Test of Mental Ability. Upon completion of the semester, the two control groups had slightly higher grades than the experimental group, but the difference was not statistically significant.

In a study conducted at the Philadelphia College of Pharmacy and Science, Keetz (1968) randomly assigned 53 second-semester freshmen with low GPA's (below .67) to an experimental CRSS class or a control group receiving no instruction. There were 26 students in the experimental group who were required to enroll in the course. The 27 students in the control group were not permitted to enroll in the course. Keetz analyzed data at the end of the semester in which the course was taught and found that students in the experimental group did not attain higher GPA's than those in the control group.

Colvin (1968) randomly assigned State University at Fredonia freshmen who scored below the 50th percentile on the Cooperative Reading Test, Form 1B, to either a control or experimental group. Students in the experimental group were required to enroll in a CRSS class; the control group was not. At the end of the semester

in which the course was taught, the experimental group did not attain a statistically significant higher GPA than the control group.

Finally, an evaluation of the Miami-Dade Junior College remedial reading-writing program was completed by Losak (1970). There were 427 students in the experimental group, and the control group consisted of 73 randomly selected students who were eligible for the remedial program but were precluded from taking it and enrolled instead in a regular freshman English course. Losak concluded that there were no "meaningful" differences between the two groups either in terms of student withdrawal from college or GPA at the end of the spring.

In summary, these research reports, several of which controlled for motivation, seem to support the notion that participation in a CRSS program does not result in students attaining a higher GPA. The same conclusion was reached even when researchers were unable to control for motivation. It should be noted that several of the researchers (Colvin, 1968; Durkee, 1968; Keetz, 1968; King et al., 1968; Regensberg, 1966) followed up their subjects for only the semester in which the course was taught. It may be unreasonable to expect an immediate return on such a course. On the whole, however, these studies were more carefully executed than those studies which showed a positive correlation between participation in CRSS and GPA. It seems reasonable to conclude that the effectiveness of CRSS programs is not well established.

In all of the aforementioned studies, the experimental group appeared to receive a traditional teacher-directed treatment. The reading instructor selected the reading-study skills he felt the

students needed to develop and improve. Students were taught together in a group at the same time using the same teacher-selected materials. In a few rare instances, the students supplemented their class instruction with some "individualized" instruction in a reading laboratory.

Student-Directed Programs

An alternative to the teacher-directed (TD) approach to teaching a CRSS class is the student-directed (SD) approach. Only two researchers, Maxwell (1963) and Noall (1961), have evaluated this type of approach in which students self-selected the reading-study skills they wished to develop and worked independently at their own pace on self-directing, self-correcting materials. Noall's study, however, was conducted with high school students. There were very few college-level studies (Maxwell and Magoon, 1962; Spache, Standlee and Neville, 1960; Veale, 1967) which compared the SD approach to the TD approach.

Noall (1961) attempted to discover the "feasibility" of a SD high school reading program. Statistical significance of gains made in reading improvement was determined by critical ratios from the pre- and posttest scores of three reading tests. The group made significant gains (.01 level) on all of the tests. But because of the absence of a control group, Noall was unable to claim that success was due to the instructional program.

An evaluation of a SD CRSS program was conducted by Maxwell (1963). A total of 320 "low-achieving" applicants to the University of Maryland were required to attend a special six-week pre-college summer session in order to qualify for continued

enrollment in the University. All students were required to enroll in freshman English and to elect mathematics, sociology or American government for their other course. In addition, students were given the opportunity to enroll in a SD reading course on a voluntary basis. At the end of the summer session, 176 students attained grades enabling them to continue at the University and 144 failed. The successful students attended the reading-study skills class significantly more often than the unsuccessful students. It is not possible, however, to determine whether this success can be atrributed to the SD CRSS program or simply to motivation.

Comparative Studies

One of the first, if not the earliest, college-level studies which compared SD and TD instructional approaches to CRSS instruction was conducted by Spache, Standlee, and Neville (1960). A SD group was compared to two TD groups, one using workbooks and the other audio-visual materials. Volunteers for the reading programs were randomly assigned to the two TD groups, while those students who could not attend their assigned group were enrolled in the SD group. Pre- and posttest scores on the Diagnostic Reading Test, Survey Section, and a locally prepared Inventory of Reading Habits were analyzed by means of the analysis of covariance statistical technique. There were no significant differences between the three groups on measures of rate of reading, vocabulary, and reading comprehension. However, the SD class achieved more favorable reading habits and attitude scores.

Maxwell and Magoon (1962) compared the two approaches by analyzing attendance records of all students who enrolled in the University of Maryland's voluntary, non-credit CRSS Laboratory from 1957 to 1961. From 1957 to 1960, small TD discussion groups and "structured" courses were the basic approaches used in the reading laboratory. In 1960, a SD, self-help program was developed. There was a 49% increase in the number of laboratory sessions attended in the year the SD program began. The mean number of laboratory sessions attended was 11.2 as compared to 7.5 in the previous years when the TD program was in progress. Thirty-nine percent of the SD group participated in 11 or more sessions, as compared to only 17% and 15% for the previous two years. The increased attendance, however, might be attributed, in part, to the instructors' enthusiasm for the new SD approach. The writers presented no evidence to indicate that increased attendance in the laboratory resulted in greater student improvement in reading and study skills or college grades.

A portion of Veale's (1967) doctoral dissertation compared the two instructional approaches to CRSS instruction. In her sample, there were 86 students with ages ranging from 17 years, 8 months, to 32 years, 5 months. Two groups, equated for differences in intelligence, were formed. Student achievement was determined by measuring the difference between pre- and posttest scores on alternate forms of the Nelson-Denny Reading Test, the Diagnostic Reading Tests, the California Phonics Survey Test, and the diagnostic and evaluation sections of Tactics in Reading I. When adjustments were made in intelligence, there were no significant differences in the effects of the two different methods of

teaching.

In summary, comparative studies of SD vs. TD approaches to CRSS programs have been inconclusive. This could be due to factors such as curriculum studied by the student, length of the course, personality differences between students, and competence of instruction. Perhaps the major explanation may be the investigator's choice of research design and statistical analysis. Lesser (1971) pointed out the limitations of these choices.

> Most research on individual methods has ignored the implications of individual differences, assigning subjects randomly to two or more instructional conditions, comparing average performance on some criterion, and reporting either that there are no significant differences or that one method is more effective than the other in some general sense. This research approach has not had a fruitful history. Among other faults, averaging scores and comparing means obscure the different effects that any one method has on students with different aptitudes and motivations (McKeachie, 1961). Almost all the evidence on comparing the effectiveness of different teaching methods applies to the average student; and thus to no one student at all (Snow and Salomon, 1968).
>
> Pitting one instructional method against another while ignoring the suitability of either method to the individual characteristics of students has been called 'horse race' evaluation (Messick, 1967). In contrast to 'horse race' evaluation of instruction, our premise is that no single, best way to teach anything to all people will ever be found. Instead of searching for such general, simple solutions, it is our contention that we should be pursuing the more fundamental search for different methods suitable to different students for achieving both universal and particular goals [pp. 533-534].

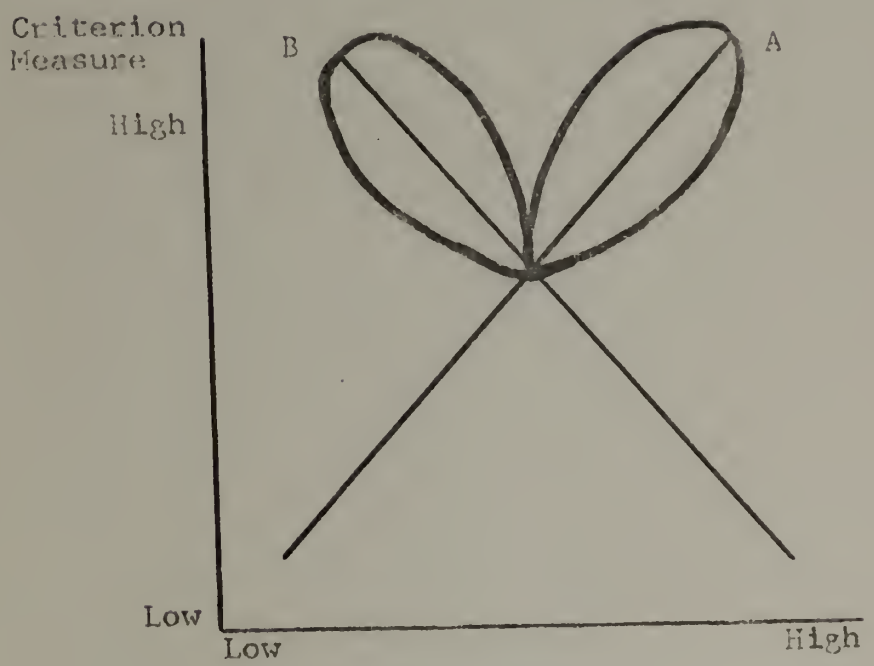
Concerning this point, Cronbach (1967) stated that "for any practical problem, there is some best group of treatments to use and some best allocation of persons to treatments...ultimately we should design treatments not to fit the average person, but to fit groups of students with particular aptitude patterns [pp. 680-681]." Aptitude is defined by Cronbach and Snow (1969)

as any characteristic of the individual that changes his probability of success in a given treatment.

Cronbach (1967) urged experimental and correlational psychologists to combine their interests and methods. He suggested that they observe experimental effects for subjects of different characteristics and conduct investigations to find aptitude-treatment-interactions (ATI's). Recently, reading specialists (Blanton, 1971; Yarington and Boffy, 1971) have recognized the need for ATI research in reading. According to Bracht (1970), the goal of research on ATI is "to find significant disordinal interactions between alternative treatments and personological variables, i.e., to develop alternative instructional programs so that optimal educational payoff is obtained when students are assigned differently to the alternative programs [p. 627]." Following is an idealized model which shows a greater proportion of students attaining instructional objectives when instruction was differentiated for different types of students. Students scoring high on Aptitude X attain greater success with Method A, while students scoring low on Aptitude X attain greater success with Method B.

Figure 1

Model of Aptitude-Treatment Interaction



CHAPTER II

HYPOTHESES AND INDIVIDUAL DIFFERENCE PREDICTOR MEASURES

The review of the literature illustrated the contradictory results of evaluations of CRSS programs. The first question asked in the present study is whether students who are required to participate in Suffolk University's CRSS program attain significantly higher grade point averages (GPA's) than similar students who are not required to participate.

Hypothesis I

The first hypothesis states that selected freshman students who are required to participate in Suffolk University's College Reading-Study Skills program will attain a significantly higher GPA than similar students who are not required to participate.

The second question asked in this study is whether certain selected variables interact with college reading-study skills instructional treatments and college success as measured by GPA.

Hypothesis II

The second hypothesis states that certain selected variables will interact with college reading-study skills instructional treatments in reference to college success as measured by GPA.

Major Predictor Variables

Several predictor variables were chosen to be studied for

one of the following reasons:

1. The variable had demonstrated its usefulness as a predictor of academic success or improvement in a CRSS course;
2. The variable had interacted significantly with treatments similar to those being investigated in this study;
3. In the opinion of the writer, the variable appeared to have the potential to interact significantly with the treatments.

Measurement #1 - Taylor Manifest Anxiety Scale (1953)

The Taylor Manifest Anxiety Scale (TMAS) consists of 28 items to be answered true or false. It was constructed by five clinical psychologists who chose from the Minnesota Multiphasic Personality Inventory statements that they regarded as overt admissions of anxiety. A test-retest reliability of .88 was reported. Scores were obtained from 179 students in an introductory psychology course after an interval of four weeks.

Based on the results of the Dowaliby (1971) study, the TMAS was chosen as an individual difference predictor measurement. Dowaliby conducted an aptitude-treatment-interaction (ATI) study with 66 college students enrolled in either a student-centered or teacher-centered section of an introuductory psychology course at a community college. The two groups were considered equal based on results of student scores on the TMAS, the Wechsler Adult Intelligence Scale, and the Mental Ability Test. Following three weeks of instruction on "principles of learning," a multiple-choice question criterion measure of

material covered only in class was administered. The same procedure was followed after three weeks of instruction on "statistics."

Dowaliby found an ATI between scores on the TMAS and classroom structure when immediate criterion measures were used as the dependent variable. Subjects scoring high on the TMAS performed significantly better in a teacher-centered classroom situation while low-scoring subjects performed better in a student-centered mode of instruction. When a delayed measure (mid-term examination covering the same material as the immediate criterion measure) was used as the dependent variable, only "trends" consistent with the results of the analysis using immediate measures were noted.

The question asked is whether scores on the TMAS will significantly interact with the instructional treatments.

Hypothesis IIA

The hypothesis states that in reference to scores on the Taylor Manifest Anxiety Scale, the higher a student scores, the more his learning will be facilitated by teacher-directed instruction and the lower a student scores, the more his learning will be facilitated by student-directed instruction.

Measurement #2 - James Internal-External Scale (1957)

The James Internal-External Scale is a 60-item questionnaire designed to measure an individual's general tendency to view events as being internally or externally controlled. Internally-oriented students perceive events in their environment as being a

consequence of their own action and thereby under personal control. Externally-oriented students perceive events in their environment as a consequence of the actions of others and therefore beyond personal control.

No validity or reliability data is available on the test. The Mathis (1970) study, however, indicated its potential as an individual difference predictor. He assigned 40 ninth-grade male students to one of four experimental subgroups containing 10 subjects each: Group I, internal personality in an internal learning environment; Group II, internal personality in an external environment; Group III, external personality in an internal environment; and Group IV, external personality in an external environment.

The dependent variable was reading rate and performance as measured by Reading Eye photographs. The internal environment students studied programmed material designed to be as fully student-controlled as possible. The activities of the students in the external environment were made to appear as fully teacher-controlled as possible. It was concluded that when students were placed in a congruent learning environment (as with Groups I and IV), they did "appreciably better than when placed in the incongruent setting." No tests of statistical significance were reported for differences between groups.

The question asked is whether scores on the James Internal-External Scale will significantly interact with the instructional treatments.

Hypothesis IIB

The hypothesis states that in reference to the James Internal-External Scale, the more externally-oriented a student scores, the more his learning will be facilitated by teacher-directed instruction and the more internally-oriented a student scores, the more his learning will be facilitated by student-directed instruction.

Measurement #3 - Preferred Instructor Characteristics Scale (1957)

The Preferred Instructor Characteristics Scale (PICS) was designed by Krumboltz and Farquhar and is purported to measure student preference for an "affective" instructor or a "cognitive" instructor. The authors defined the cognitive instructor as one concerned with the intellectual, abstract, subject-matter goals of teaching and the affective instructor as being concerned with emotional adjustment and student interactions in the classroom. To obtain some degree of face validity, the authors submitted the statements on the PICS to three advanced graduate students in educational psychology and one instructor in humanities to separate the items according to whether they were "affective" or "cognitive." Statements which were unanimously classified by all four judges plus the two authors were retained for the scale. In its final form, the scale included six cognitive and six affective items. The authors reported a test-retest reliability coefficient of .88 and an internal consistency reliability coefficient of .90.

Krumboltz and Farquhar found that the low PICS group (preference for "affective" teacher) decreased their Survey of Study Habits and Attitudes scores after instruction in a CRSS course

while the high PICS group (preference for "cognitive" teacher) increased their scores. The writers found no interaction between PICS and mode of instruction. However, if a different criterion measure were used, such an interaction would appear plausible. Consequently the PICS was included as an individual difference measure in this study, inasmuch as GPA is the criterion measure.

The question asked is whether scores on the PICS would significantly interact with the instructional treatments.

Hypothesis IIC

The hypothesis states that in reference to the Preferred Instructor Characteristics Scale, the more a student prefers an affective type of instructor, the more his learning will be facilitated by teacher-directed instruction and the more a student prefers a cognitive type of instructor, the more his learning will be facilitated by student-directed instruction.

Other Individual Difference Predictor Measures

The following scores and data were available for each student in the experimental groups and were explored as individual predictor measures.

Brown-Holtzman Survey of Study Habits and Attitudes (1967)

This inventory is designed to identify students whose study habits and attitudes are generally unlike those of students who do well in academic work. Students are expected to use the results of the test "as a foundation for self-improvement."

The subscales of the instrument are: Work Methods (use of effective study procedures, skill and efficiency in doing academic assignments); Delay Avoidance (promptness in completing assignments and ability to resist distractions); Study Habits (combined scores of the Work Methods and Delay Avoidance scales); Teacher Approval (feelings and opinions about teachers, their classroom behavior, and their methods); Education Acceptance (approval of educational objectives, practices and requirements); Study Attitudes (combined scores of Teacher Approval and Education Acceptance); Study Orientation (combined scores of Study Habits and Study Attitudes, an overall measure of study habits and attitudes).

The 1953 edition of the instrument was validated by using one-semester grades of students in a number of colleges as a criterion. The correlations between the Survey scores and GPA's of 1,756 men and 1,118 women in ten colleges varied from .27 to .66 for men and from .26 to .65 for women. The average validity coefficients across the ten colleges were .42 and .45 for men and women respectively. The 1960 edition was validated on six colleges with 1,772 cases. The validity coefficients varied from .25 to .45 with a weighted score of .36. The correlations of the subscales with GPA were .31, .32, .25, and .35 respectively for Delay Avoidance, Work Methods, Teacher Approval, and Education Acceptance.

The internal consistency reliability measure was computed by using the Kuder-Richardson Formula for estimating test reliability from the variance of total scores and the sum of the item variances. Reliability coefficients obtained for the four

basic subscales ranged from .87 to .89. Two test-retest studies were completed. The test-retest coefficients with a four-week interval were .93 (Delay Avoidance), .91 (Work Methods), .88 (Teacher Approval) and .90 (Education Acceptance). The corresponding coefficients for the fourteen-week interval were .88, .86, .83, and .85 respectively.

Nelson-Denny Reading Test (1960)

This test was prepared for use with students in high schools and colleges. It measures vocabulary, comprehension, and reading rate, and also yields a total score. The test was standardized on 4,000 cases at each grade level, nine through twelve. Norms are supplied for the level of the student being tested.

The vocabulary subtest had a mean index of 47.5 and 47.4 for Forms A and B respectively, while the comprehension subtest had a mean index of 44.6 and 45.3 respectively. Reliability coefficients, computed by the Equivalent Forms method, were .93 for vocabulary, .81 for comprehension, .93 for rate and .92 for total.

McGraw-Hill Basic Skills System (1970)

The reading, study skills, and vocabulary sections of the McGraw-Hill Basic Skills System (MHBSS) were prepared for use with high school juniors and seniors who plan to attend college, two-year college students, and freshmen and sophomores in four-year colleges and universities.

The reading test is intended to measure the student's level of competence in those reading skills which are most relevant to academic success. The test has two forms, A and B, and has three

sections: reading rate and comprehension, skimming and scanning, and paragraph comprehension.

The norming group of 1,562 included approximately equal numbers of freshmen (and a few sophomores) in four-year colleges and universities, two-year college students, and college-bound high school juniors and seniors. The Nelson-Denny Reading Test was used to determine criterion-related validity. The total score of the MHBSS Reading Test had a Pearson product-moment correlation coefficient of .55, .64, and .67 respectively for the vocabulary, comprehension, and total scores of the Nelson-Denny Reading Test. The coefficient of internal consistency (KR-20 formula) was .89 for the total score on both forms of the test.

The MHBSS Study Skills Test is intended to indicate the "readiness" of the student to make the transition from high school to college. The test has two forms, A and B, and is divided into four sections: problem solving, underlining, library information, and study skills information. The nature of the norming group was the same as that of the reading test. Concerning the validity of the test, Raygor (1970) wrote:

> No effort has been made to correlate scores on the MHBSS Study Skills Test or the MHBSS Inventory of Study Habits and Attitudes with a criterion score of any kind. Some users will probably wish to use these scores to place students in special classes to learn how to study or in counseling situations. Responsibility for demonstrating the validity of these test scores for these purposes in a situation at a particular institution rests with the user /p. 31, Examiner's Manual 7.

The coefficient of internal consistency (KR-20 formula) for the total score was .78 for Form A and .80 for Form B.

The vocabulary test is intended to measure knowledge of word meaning and knowledge of the meanings of word parts. The nature of

the norming group was the same as that of the reading and study skills tests. Criterion-related validity of the test was determined by correlating it with the vocabulary score of the Nelson-Denny Reading Test. The Pearson product-moment correlation coefficient was .74. The coefficient of internal consistency (KR-20 formula) was .88 for both forms of the test.

CHAPTER III

METHODOLOGY

Sample

The sample included 87 students from the 1971 freshman class of Suffolk University, Boston. These students scored below 475 on the verbal section of the Scholastic Aptitude Test and had graduated in the bottom 60th percent of their high school class. Subjects were randomly assigned to one of three groups: a non-credit teacher-directed reading-study skills class (26 students); a non-credit student-directed reading-study skills class (32 students); a control group receiving no training in reading-study skills (29 students). Those assigned to the reading-study skills classes were required to enroll in the course as a condition of admission to the University.

There were two sections of each teaching approach. The investigator taught all sections. Fifty-minute classes were held twice a week for 15 weeks. Students in both the experimental and control groups carried between 12 and 15 academic credit hours.

Table 1 presents the analysis of variance summary of the three groups on the Scholastic Aptitude Test-Verbal Section and the vocabulary, comprehension, total, and reading rate sections of the Nelson-Denny Reading Test. It is clear that the groups were evenly matched on these variables. The significance of the differences was tested using a one-way analysis of variance technique.

TABLE 1

Analysis of Variance Summary.
Entrance Scores on the
Scholastic Aptitude Test-Verbal, Nelson-Denny Reading Test.
Teacher-Directed, Student-Directed, Control (N=87)

Variable	TrDr Group (N=26)		StDr Group (N=32)		Control (N=29)		F
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	
SAT-V	414.15	33.78	429.94	30.42	423.03	39.05	1.50
N-D, Vocab	33.19	10.45	34.87	8.11	35.38	6.98	0.48
N-D, Comp	38.38	7.79	39.78	7.61	39.97	6.92	0.40
N-D, Total	71.65	16.25	74.72	12.56	75.34	12.04	0.57
N-D, Rate	271.69	92.60	283.94	81.18	278.52	69.92	0.16

Table 2 demonstrates that the two experimental groups also were matched evenly on the following variables: James Internal-External Scale, Taylor Manifest Anxiety Scale, Preferred Instructor Characteristics Scale, MHBSS Reading Test, MHBSS Vocabulary Test, MHBSS Study Skills Test, and Survey of Study Habits and Attitudes.

Description of Groups

Student-Directed (SD)

The philosophy underlying this approach is that students, working individually within a group, have the ability to improve their own reading-study skills under a competent facilitator. The teacher does not actively teach in a formal sense; his role is to aid students when they have difficulty and to confer periodically with them regarding their progress.

Each student plans his own reading program based on the results of diagnostic testing and/or his own felt needs (see Appendix A). Brunner (1961) referred to this approach as teaching that takes place in the "hypothetical" mode when

> the teacher and student are in a more cooperative position with respect to what in linguistics would be called 'speaker's decisions.' The student is not a bench-bound listener, but is taking a part in the formulation and at times may play the principal role in it [p. 23].

Edwards (1961) was one of the first reading specialists to support the SD approach to CRSS instruction. She described how students in her program discovered their own strengths and weaknesses in reading-study skills and proceeded to select materials from a number of sources to remediate their weaknesses. Each student tailored the course to "his or her interests, needs, and objectives." Edwards based her program on some "principles

TABLE 2

Analysis of Variance Summary.
James Internal-External Scale; Taylor Manifest Anxiety Scale;
Preferred Instructor Characteristics Scale;
McGraw-Hill Basic Skills System: Reading, Vocabulary and
Study Skills; Survey of Study Habits and Attitudes
Teacher-Directed Group vs. Student-Directed Group (N=58)

Variable	TrDr Group (N=26)		StDr Group (N=32)		F
	$\bar{X}$	SD	$\bar{X}$	SD	
James Internal-External Scale	42.34	6.63	41.50	9.52	0.14
Taylor Manifest Anxiety Scale	8.54	4.67	8.50	4.78	0.00
Preferred Instructor Characteristics Scale	8.58	8.37	7.44	6.97	0.32
MHBSS, Reading	47.15	5.94	48.13	6.15	0.37
MHBSS, Vocabulary	25.27	8.55	26.63	6.68	0.46
MHBSS, Study Skills	35.96	5.89	37.91	5.58	1.66
Survey of Study Habits and Attitudes	82.27	28.65	83.56	29.01	0.03

governing the reading workshop" as set forth by Carter and McGinnis (1953). Some of these principles were:

1. Every student should know how well he reads and should select for himself the specific reading abilities he needs to acquire.

2. The student must understand that he can improve his reading ability and that the responsibility for doing so rests with him.

3. Each student should be given the opportunity to set up his own reading objectives and to attain them at his own rate in accordance with his own plan [p. 47].

Subjects in the SD group were administered the reading, vocabulary, and study skills tests from the McGraw-Hill Basic Skills System (1970). The results of the test were used to develop a profile on each student's strengths and weaknesses in the following reading-study skills areas: paragraph comprehension, skimming and scanning, reading flexibility, reading rate, vocabulary, problem solving, underlining, library information, and study skills information (see Appendix B).

Each student's profile was presented to him and he made his own decisions relative to the specific reading-study skills he wished to develop. Students worked independently and at their own rate on self-selected, self-directed, self-corrected materials.

Teacher-Directed (TD)

The TD approach is basically a traditional lecture-discussion format. The philosophy of this method is that the instructor is the authority whose task is to convey information about reading-study skills to students so that they may master and apply them. The teacher is the classroom's most active member, carefully directing and controlling the learning situation. He lectures, demonstrates, elicits discussion, and plans a sequential

instructional program.

Brunner (1961) referred to this approach as teaching that takes place in the "expository" mode.

> ...the decisions concerning the mode and pace and style of exposition are principally determined by the teacher as expositor; the student is the listener. If I can put the matter in terms of structural linguistics, the speaker has a quite different set of decisions to make than the listener; the former has a wide choice of alternatives for structuring, he is anticipating paragraph content while the listener is still intent on the words, he is manipulating the content of the material by various transformations, while the listener is quite unaware of these internal manipulations [p. 237].

Cantor (1953) suggested some assumptions about "orthodox" teaching that are applicable to the TD approach. Two such assumptions are:

1. The teacher's responsibility is to set out what is to be learned and the student's responsibility is to learn it;
2. The pupil's acquisition of knowledge is the responsibility of the teacher.

One reading expert who supported the TD approach to reading instruction was Karlin (1964). He stated, "Learning should not be left to chance; the teacher should guide learning so as to insure some degree of success. Reading skills are learned more effectively through instruction than by trial and error [p. 607]."

Students in the TD group also were administered the various sections of the McGraw-Hill Basic Skills System (1970). Based on the results of the tests, an instructional program was developed (see Appendix C). The instructor lectured on reading-study skills of his choice and often led students in a period of practice and discussion on them. All such practice exercises were completed at

the direction of, and with materials prescribed by, the instructor.

Description of Criterion Measures

Overall grade point average (GPA) and GPA in verbal subjects only were used as the criterion measures. Overall GPA was selected as one of the criterion measures because the major purpose of most College Reading-Study Programs is to produce improvement in the scholastic standing of students (Pauk, 1965). Robinson (1950) stated: "Academic performance is clearly the sine qua non for the validation of remedial courses...and [such courses] must necessarily stand or fall on the basis of this single criterion, however ingeniously alternative standards of comparisons are defended [p. 83]." Verbal GPA was selected as the other criterion measure because the majority of CRSS programs stress English and social studies reading and place minimal emphasis on reading skills required in science and mathematics (Wright, 1962).

Summary of Main Variables

1. Sex
2. Scholastic Aptitude Test - Verbal
3. James Internal-External Scale
4. Taylor Manifest Anxiety Scale
5. Preferred Instructor Characteristics Scale
6. Total Reading (Mc-Graw Hill)
7. Reading Rate - Easy (McGraw-Hill)
8. Reading Rate - Difficult (McGraw-Hill)
9. Reading Rate Flexibility (McGraw-Hill)
10. Retention
11. Skimming and Scanning
12. Paragraph Comprehension
13. Vocabulary (McGraw-Hill)
14. Study Skills Total
15. Problem Solving
16. Underlining
17. Library Information

18. Study Skills Information
19. Study Skills Orientation
20. Delay Avoidance
21. Work Methods
22. Study Habits
23. Teacher Attitude
24. Education Acceptance
25. Study Attitudes
26. Total Reading (Nelson-Denny)
27. Vocabulary (Nelson-Denny)
28. Comprehension (Nelson-Denny)
29. Reading Rate (Nelson-Denny)

Criterion Tests

30. Fall Overall Grade Point Average
31. Fall Verbal Grade Point Average
32. Spring Overall Grade Point Average
33. Spring Verbal Grade Point Average

CHAPTER IV

RESULTS

Hypothesis I

Hypothesis I states that selected freshman students who are required to participate in Suffolk University's College Reading-Study Skills (CRSS) Program will attain a significantly higher grade point average (GPA) than similar students who are not required to participate.

The analysis of variance summary in Table 3 illustrates that the hypothesis is partially supported when Fall Verbal GPA is used as the criterion. The Fall Verbal GPA of the Teacher-Directed (TD) group was significantly higher than that of both the Student-Directed (SD) and the control groups. However, the hypothesis is not supported when the other three criterion measures are considered.

Since pre- and posttest scores on reading and study skills were available for the experimental groups, it was decided to evaluate further the Suffolk University CRSS Program by analyzing these scores. A one-way analysis of variance technique with repeated measures was used to determine whether significant progress had been made on any of the reading-study skills test scores.

Tables 4 through 7 indicate that there were no significant differences between the experimental groups on initial test scores, and that the groups made significant gain score changes on each of the following: McGraw-Hill Basic Skills System (MHBSS) Reading

TABLE 3

Analysis of Variance Summary.
Overall Grade Point Average, Fall and Spring;
Verbal Grade Point Average, Fall and Spring.
Teacher-Directed, Student-Directed, and Control (N=87)

Criterion	TrDr Group (N=26)		StDr Group (N=32)		Control (N=29)		F
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	
Fall OGPA	1.91	0.73	1.71	0.64	1.80	0.59	0.69
Spring OGPA	2.01	0.90	1.96	0.65	1.90	0.67	0.15
Fall VGPA	2.08	0.61	1.72	0.58	1.74	0.53	3.36*
Spring VGPA	2.16	0.79	1.89	0.59	1.87	0.58	1.87

*$p < .05$
**$p < .01$

TABLE 4

One-Way Analysis of Variance with Repeated Measures.
Pre-Post McGraw-Hill Basic Skills System Reading Test Scores.
Teacher-Directed and Student-Directed Groups (N=58)

Test and Group	Pre		Post		F	F	F
	$\bar{X}$	SD	$\bar{X}$	SD	Initial Group Diff.	Combined Group Pre-Post	Between Group Pre-Post
Total Score:					0.37	9.38**	0.01
TrDr	47.15	5.94	51.04	8.33			
StDr	48.12	6.15	52.25	7.41			
Reading Rate - Easy:					0.13	9.29**	0.01
TrDr	248.04	55.03	291.11	86.00			
StDr	244.31	39.24	284.78	97.55			
Reading Rate - Difficult:					0.03	8.66**	0.92
TrDr	196.88	47.52	216.46	56.06			
StDr	185.81	43.79	224.34	61.85			
Flexibility:					0.04	4.21*	2.92
TrDr	47.85	16.93	76.23	51.78			
StDr	59.22	30.55	61.81	50.74			
Retention:					0.65	5.04*	0.83
TrDr	12.23	2.80	12.96	3.30			
StDr	12.15	2.54	13.94	3.59			
Skimming:					0.30	0.69	0.45
TrDr	16.81	3.86	16.92	4.02			
StDr	16.72	3.59	17.78	3.71			
Paragraph Comprehension:					0.01	8.57**	1.94
TrDr	18.42	3.58	21.15	3.73			
StDr	19.56	2.51	20.53	3.62			

*$p < .05$
**$p < .01$

TABLE 5

One-Way Analysis of Variance with Repeated Measures.
Pre-Post McGraw-Hill Basic Skills System Vocabulary Test Scores.
Teacher-Directed and Student Directed Groups (N=58)

Test and Group	Pre		Post		F	F	F
	$\bar{X}$	SD	$\bar{X}$	SD	Initial Group Diff.	Combined Group Pre-Post	Between Group Pre-Post
Vocabulary:					0.46	2.16	0.92
TrDr	25.63	8.55	28.85	7.72			
StDr	26.62	6.68	27.37	8.53			

TABLE 6

One-Way Analysis of Variance with Repeated Measures.
Pre-Post McGraw-Hill Basic Skills System Study Skills Test Scores.
Teacher-Directed and Student-Directed Groups (N=58)

Test and Group	Pre		Post		F	F	F
	$\bar{X}$	SD	$\bar{X}$	SD	Initial Group Diff.	Combined Group Pre-Post	Between Group Pre-Post
Total Score:					1.66	1.42	0.00
TrDr	35.97	5.89	37.37	5.57			
StDr	37.91	5.59	39.25	6.64			
Problem Solving:					3.22	0.18	0.18
TrDr	8.73	1.46	8.38	1.72			
StDr	9.28	2.49	9.28	2.56			
Underlining:					0.09	0.24	0.94
TrDr	4.88	1.41	4.97	1.31			
StDr	5.22	1.88	4.75	2.20			
Library Information:					0.21	4.45*	0.44
TrDr	11.00	2.87	11.73	2.41			
StDr	11.22	2.99	12.62	2.51			
Study Skills Information:					1.41	1.26	0.08
TrDr	11.42	3.30	12.15	2.63			
StDr	12.19	2.52	12.62	2.70			

*$p < .05$
**$p < .01$

TABLE 7

One-Way Analysis of Variance with Repeated Measures.
Pre-Post Nelson-Denny Reading Test Scores.
Teacher-Directed and Student-Directed Groups (N=58)

Test and Group	Pre		Post		F	F	F
	$\bar{X}$	SD	$\bar{X}$	SD	Initial Group Diff.	Combined Group Pre-Post	Between Group Pre-Post
Total Score:					0.55	11.29**	0.16
TrDr	71.65	16.25	81.69	16.36			
StDr	74.72	12.56	82.59	12.25			
Vocabulary:					0.90	6.61*	0.50
TrDr	33.19	10.45	38.54	8.97			
StDr	34.87	8.12	37.91	7.50			
Comprehension:					0.93	9.78**	0.00
TrDr	38.31	7.79	43.15	9.65			
StDr	39.78	7.61	44.69	8.37			
Reading Rate:					0.16	4.59*	0.01
TrDr	271.69	92.60	308.15	86.66			
StDr	283.94	81.19	317.12	88.31			

*$p < .05$
**$p < .01$

Test Total score and the Reading Rate-Easy, Reading Rate-Difficult, Flexibility, Retention, and Paragraph Comprehension part scores; MHBSS Study Skills Test Library Information part score only; and Nelson-Denny Reading Test Total score and the Vocabulary, Comprehension, and Reading Rate part scores. When the experimental groups were compared for differences on the amount of gain made on the above test scores, no significant differences were found.

Tables 4 through 6 also indicate that the experimental groups did not make a significant score change on the following: MHBSS Reading Test Skimming and Scanning part score; MHBSS Vocabulary Test Total score; and MHBSS Study Skills Test Total score and the Problem Solving, Underlining, and Study Skills Information part scores.

In summary, the hypothesis is not supported, except for the Fall Verbal GPA criterion. The groups did, however, make significant progress on several reading and study skills test scores. But since the same scores were not available for the control group, it is not possible to conclude that the gains were the result of the experimental treatments.

Hypothesis II

This hypothesis states that certain selected variables will interact with college reading-study skills instructional treatments in reference to college success as measured by grade point average.

Hypothesis II is supported. Homogeneity of variance was assumed before the regression slopes obtained between the criterion

measures and each of the predictor variables under each treatment were tested by a parallelism of regression test (Parlreg --- Statistical Reference -- Dixon and Massey, 1957, p. 218, Equation 2A). The computer program to do the analysis was created at the Stanford University Center for Research and Development of Teaching and converted and improved at the University of Massachusetts by David Coffing.

Table 8 presents the obtained F ratios. There were significant non-parallel regression slopes in relation to one or more of the four criterion variables for each of the following predictor scores: James Internal-External Scale (V3); Taylor Manifest Anxiety Scale (V4); Preferred Instructor Characteristics Scale (V5); the Study Orientation (V19), Work Methods (V21), Study Habits (V22), and Teacher Attitude (V23) part scores from the Survey of Study Habits and Attitudes; and the Library Information (V17) part score from the MHBSS Study Skills Test. There were no significant non-parallel slopes on: the Personal Data measures; the MHBSS Reading Test total and part scores; the MHBSS Vocabulary Test total score; and the Nelson-Denny Reading Test total and part scores.

Hypothesis IIA

Hypothesis IIA states that in reference to scores on the Taylor Manifest Anxiety Scale, the higher a student scores, the more his learning will be facilitated by teacher-directed instruction and the lower a student scores, the more his learning will be facilitated by student-directed instruction.

TABLE 8

Test of Parallelism of Regression Results between Predictor Variables and the Four Criterion Measures for the Total Experimental Population (N=58).

Predictor Variables	Criterion Measures Parallelism F Ratio			
	FOGPA	FVGPA	SOGPA	SVGPA
Personal Data Measures				
1. Sex	.45	3.02	.00	.95
2. Scholastic Aptitude Test-Verbal	.56	.05	.71	3.11
Psychological Variables				
3. James Internal-External Scale	3.08	.40	6.50*	2.93
4. Taylor Manifest Anxiety Scale	4.05*	3.02	.00	1.33
5. Preferred Instructor Characteristics Scale	2.01	6.37*	2.08	5.36*
MHBSS, Reading & Vocabulary				
6. Total Reading	.61	.00	2.04	.55
7. Reading Rate - Easy	.01	.27	.05	.01
8. Reading Rate - Difficult	.74	.89	.00	.26
9. Reading Flexibility	.09	1.15	.58	1.78
10. Retention	.15	.03	2.27	1.94
11. Skimming and Scanning	.01	.32	.00	.55
12. Paragraph Comprehension	.51	.16	3.33	3.45
13. Vocabulary	.03	.32	.76	1.03
MHBSS, Study Skills				
14. Total Study Skills	.30	.15	1.25	2.11
15. Problem Solving	.39	.06	.50	.03
16. Underlining	.38	.06	.29	.06
17. Library Information	.03	.00	3.22	4.32*
18. Study Skills Information	.04	.00	.00	.06
Survey of Study Habits and Attitudes				
19. Study Orientation	2.49	4.37*	1.97	2.10
20. Delay Avoidance	.65	3.50	.32	.88
21. Work Methods	4.47*	4.39*	4.25*	2.01
22. Study Habits	2.90	4.81*	2.27	1.63
23. Teacher Attitude	2.84	3.22	3.66	4.49*
24. Education Acceptance	.00	.56	.00	.13
25. Study Attitude	1.23	3.05	1.57	2.51
Nelson-Denny Reading Test				
26. Total Reading	.55	.42	.03	.20
27. Vocabulary	.00	.54	.04	.05
28. Comprehension	1.10	.16	.05	.13
29. Reading Rate	.55	.07	.08	.25

*$p < .05$
**$p < .01$

Although there were significant non-parallel regression slopes at the .05 level of significance for the Taylor Manifest Anxiety Scale in relation to the Fall Overall GPA, the hypothesis is not supported. An analysis of Figure 2 indicates that the regression slopes were opposite to the predicted direction. For high-scoring students, learning was facilitated more by student-directed instruction and for low-scoring students, learning was facilitated more by teacher-directed instruction.

Hypothesis IIB

This hypothesis states that in reference to the James Internal-External Scale, the more externally oriented a student scores, the more his learning will be facilitated by teacher-directed instruction and the more internally oriented a student scores, the more his learning will be facilitated by student-directed instruction.

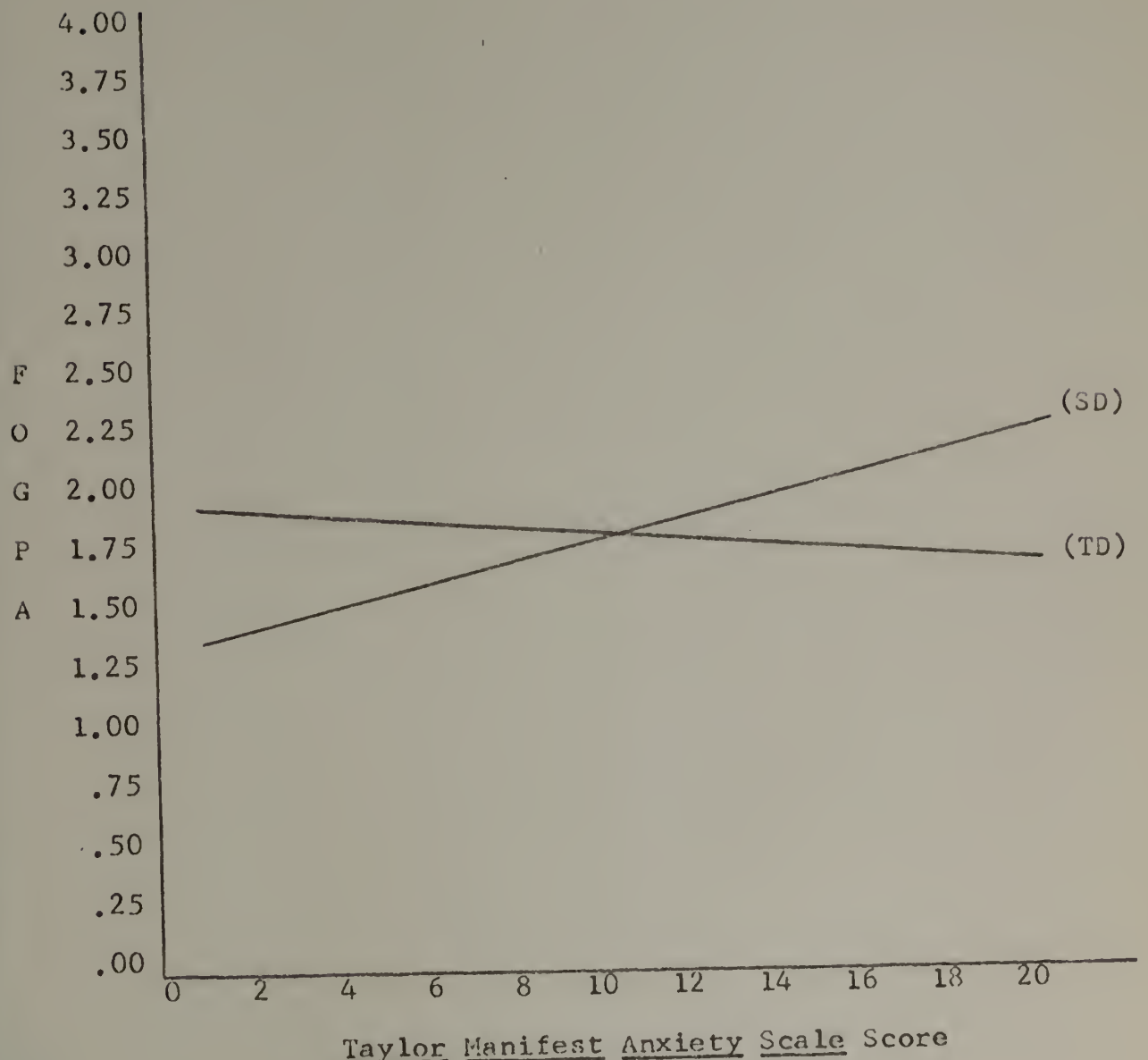
Although there were significant non-parallel regression slopes at the .05 level of significance for the James Internal-External Scale scores in relation to the Spring Overall GPA criterion, the hypothesis is not supported. An analysis of Figure 3 indicates that the regression slopes were opposite to the predicted direction. The more externally oriented a student scored, the more his learning was facilitated by student-directed instruction and the more internally oriented a student scored, the more his learning was facilitated by teacher-directed instruction.

Hypothesis IIC

This hypothesis states that in reference to the Preferred Instructor Characteristics Scale, the more a student prefers an

Figure 2

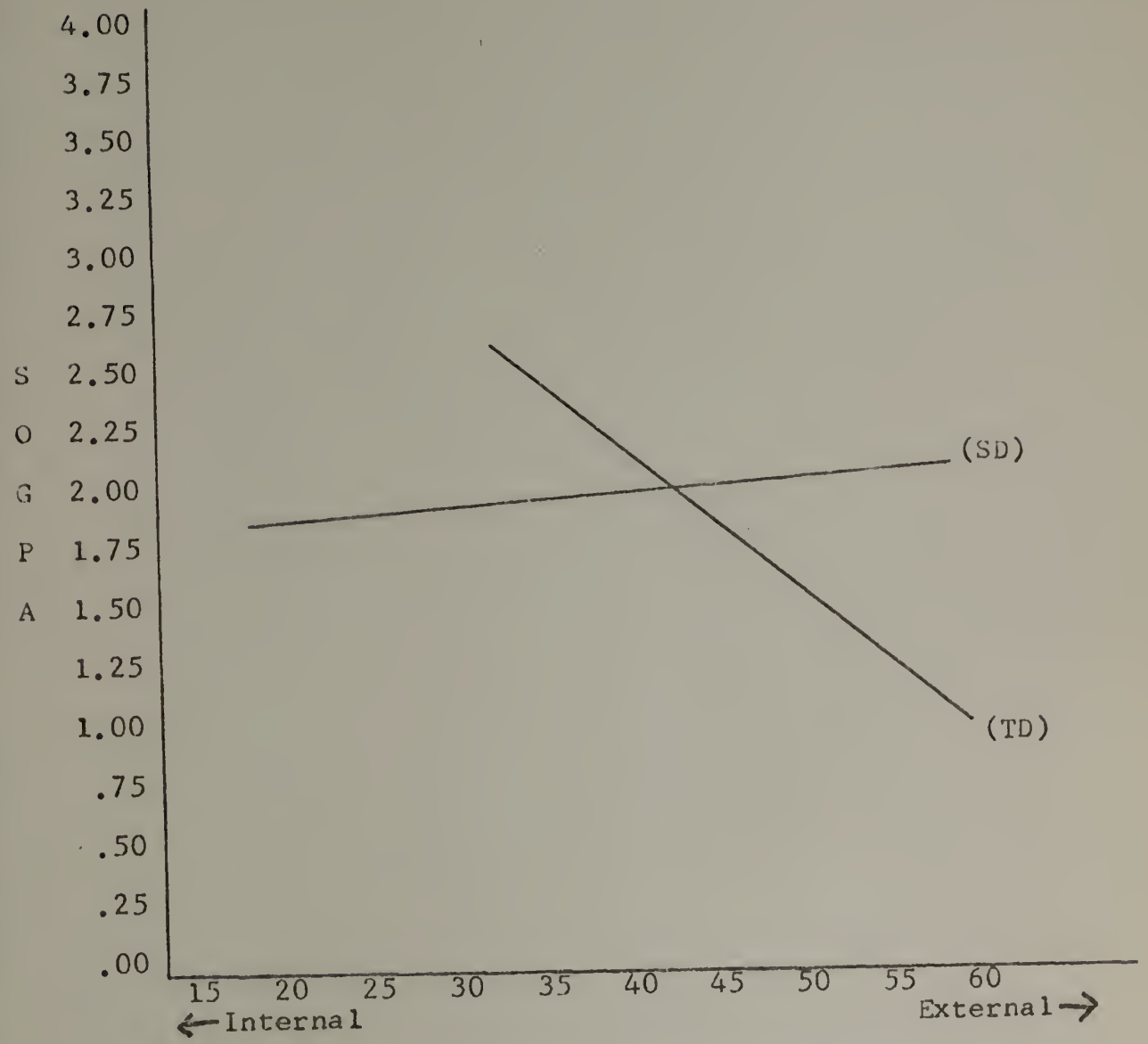
Regression Slopes with
Taylor Manifest Anxiety Scale as Predictor
and Fall Overall GPA as Criterion Measure.
Student-Directed (N=32) vs. Teacher-Directed (N=26)



The end-points of the regression lines indicate the extreme scores on the aptitude variables for each treatment group.

Figure 3

Regression Slopes with
James Internal-External Scale as Predictor
and Spring Overall GPA as Criterion Measure.
Student-Directed (N=32) vs. Teacher-Directed (N=26)



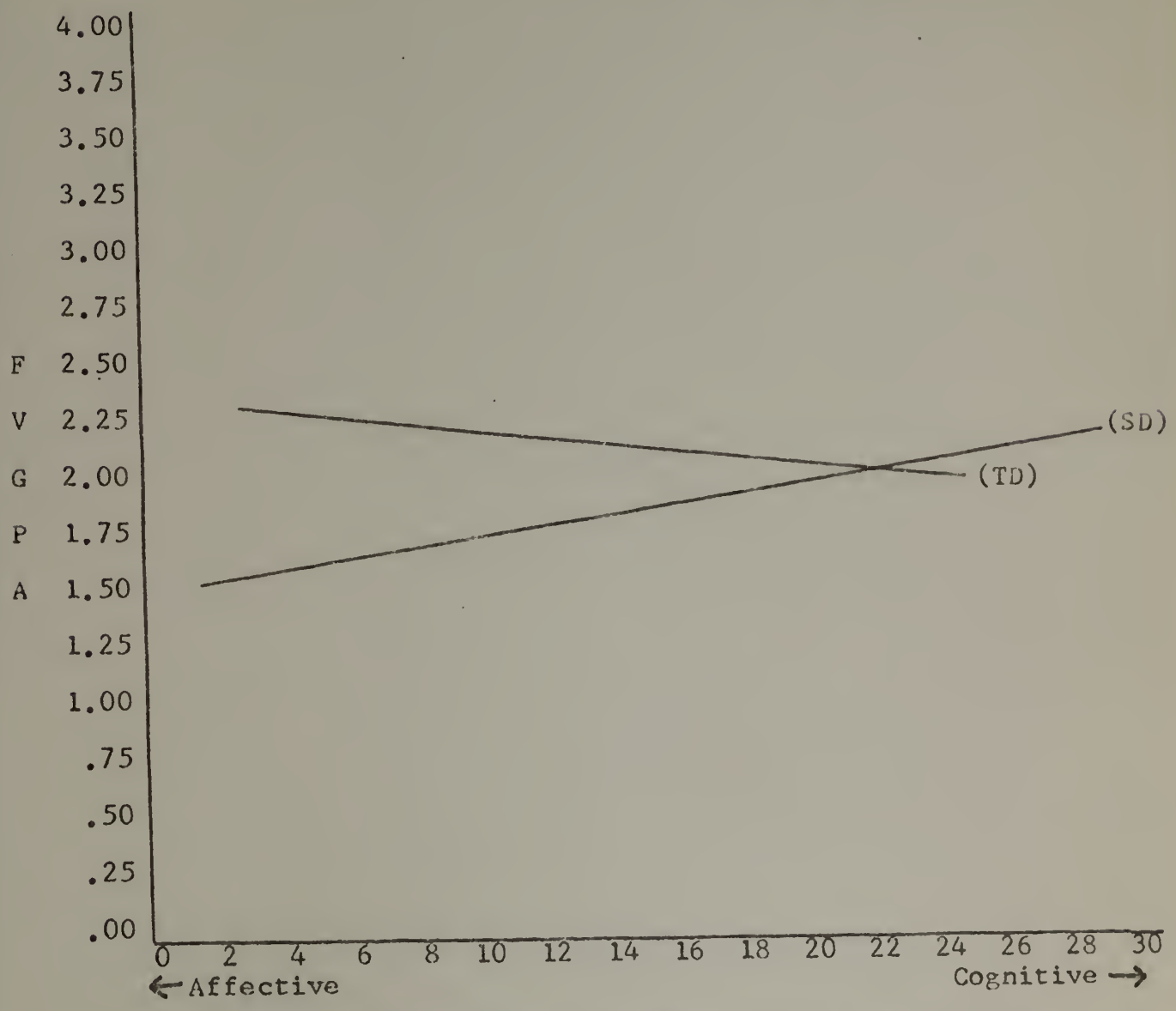
The end-points of the regression lines indicate the extreme scores on the aptitude variables for each treatment group.

affective type of instructor, the more his learning will be facilitated by teacher-directed instruction and the more a student prefers a cognitive type of instructor, the more his learning will be facilitated by student-directed instruction.

An analysis of Figures 4 and 5 indicates that the hypothesis is supported. There were significant non-parallel regression slopes at the .05 level of significance for the Preferred Instructor Characteristics Scale in relation to the Fall Verbal GPA and Spring Verbal GPA criterion measures. With Fall Verbal GPA as the criterion, the interaction was disordinal, but major treatment differences were related only to low scores (preference for an affective instructor); the lower a student's score, the more his learning was facilitated by the teacher-directed method and less by the student-directed method. (Bracht and Glass [1968] argued that ATI research that uses a treatments-by-levels factoral design should claim disordinal interaction only when the differences between alternative treatments at two levels of a personological variable are both significantly non-zero and different in algebraic sign. However, regression techniques were utlizied in this study and any crossing of treatment lines was considered to be a disordinal interaction, but not necessarily presented as evidence for an ATI.) On the Spring Verbal GPA criterion, there is a substantial disordinal interaction; the more a student preferred a cognitive type of instructor, the more his learning was facilitated by student-directed instruction and the more a student preferred an affective instructor, the more his learning was facilitated by teacher-directed instruction.

Figure 4

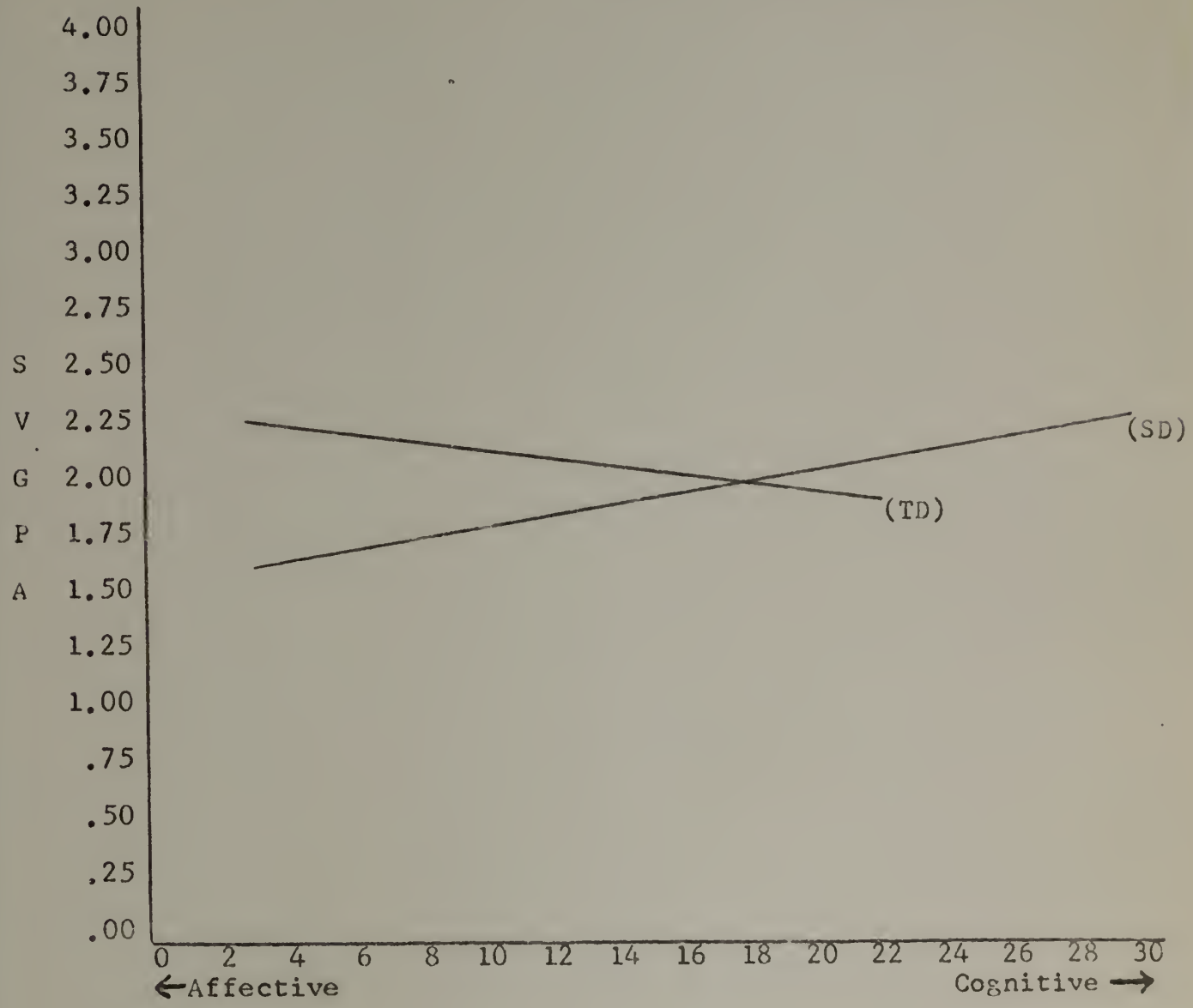
Regression Slopes with
Preferred Instructor Characteristics Scale as Predictor
and Fall Verbal GPA as Criterion Measure.
Student-Directed (N=32) vs. Teacher-Directed (N=26)



The end-points of the regression lines indicate the extreme scores on the aptitude variables for each treatment group.

Figure 5

Regression Slopes with
Preferred Instructor Characteristics Scale as Predictor
and Spring Verbal GPA as Criterion Measure.
Student-Directed (N=32) vs. Teacher-Directed (N=26)



The end-points of the regression lines indicate the extreme scores on the aptitude variables for each treatment group.

Other Interactions

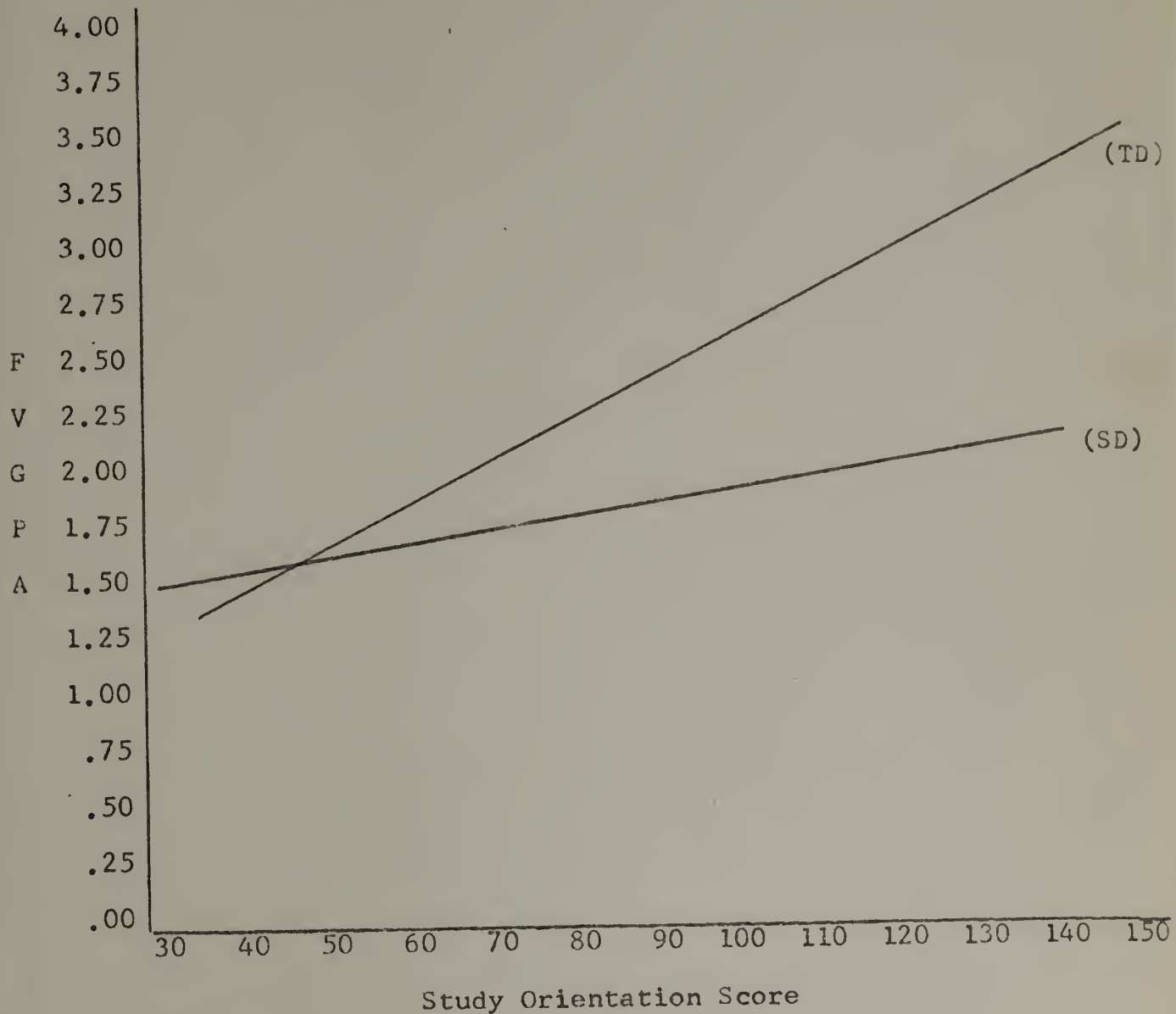
As can be seen in Figures 6 through 11, several of the scores from the Survey of Study Habits and Attitudes produced significant non-parallel regression slopes at the .05 level of significance, but for all practical purposes, only high scores on the total score (Study Orientation - Figure 6) and certain part scores (Work Methods - Figures 7 through 9, Study Habits - Figure 10, and Teacher Attitude - Figure 11) of the Survey produced strong differences between the two treatment groups, and the lower a student scored on these variables, the less important the mode of instruction.

As can be seen in Figure 12, the Library Information score from the MHBSS Study Skills Test produced a significant non-parallel regression slope at the .05 level of significance with Spring Verbal GPA as the criterion. For students scoring low, learning was facilitated more by the student-directed method and for students scoring high, learning was facilitated more by the teacher-directed method.

Table 9 summarizes the significant non-parallel regression slopes by each criterion measure.

Figure 6

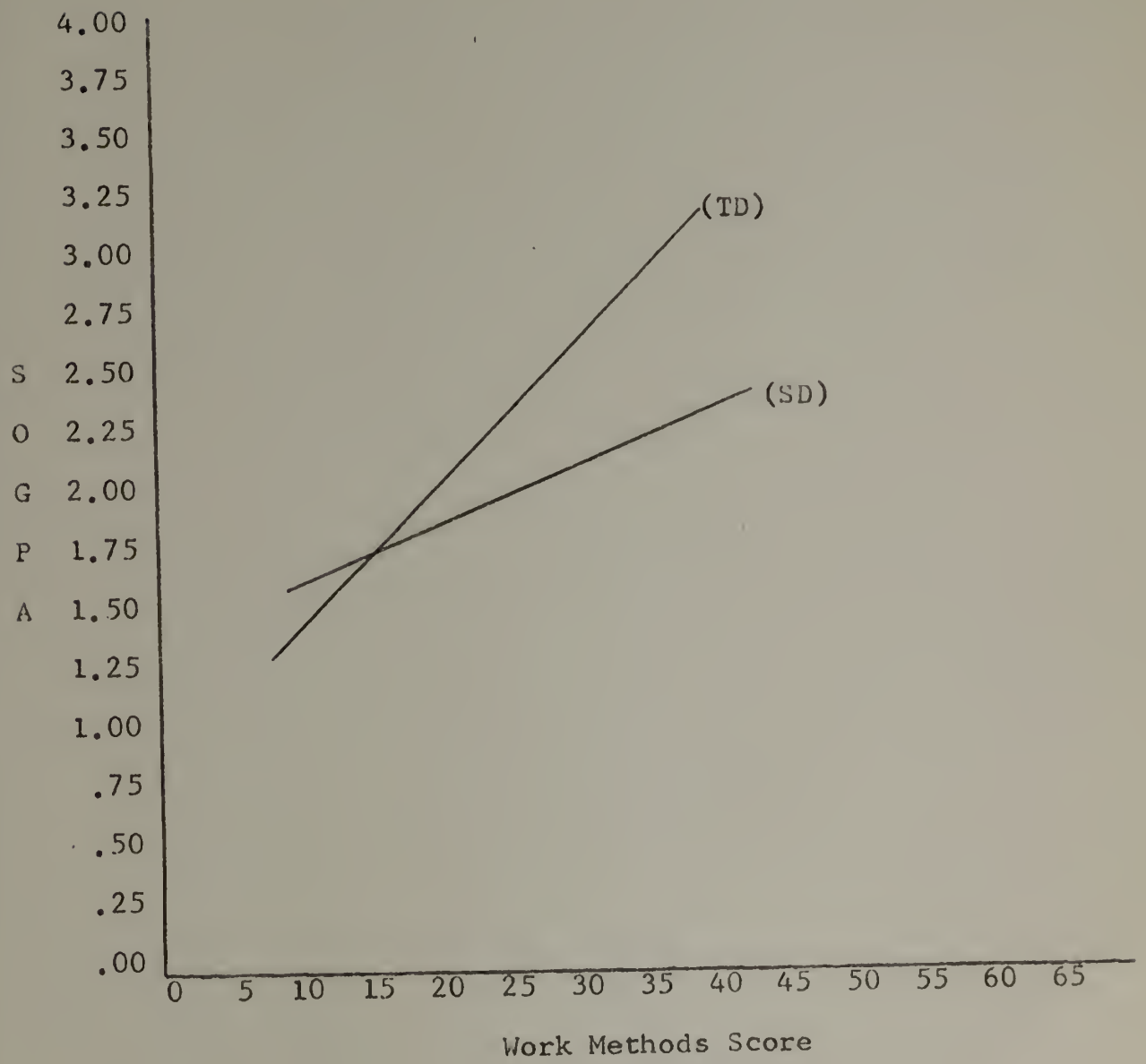
Regression Slopes with
Study Orientation as Predictor
and Fall Verbal GPA as Criterion Measure.
Student-Directed (N=32) vs. Teacher-Directed (N=26)



The end-points of the regression lines indicate the extreme scores on the aptitude variables for each treatment group.

Figure 7

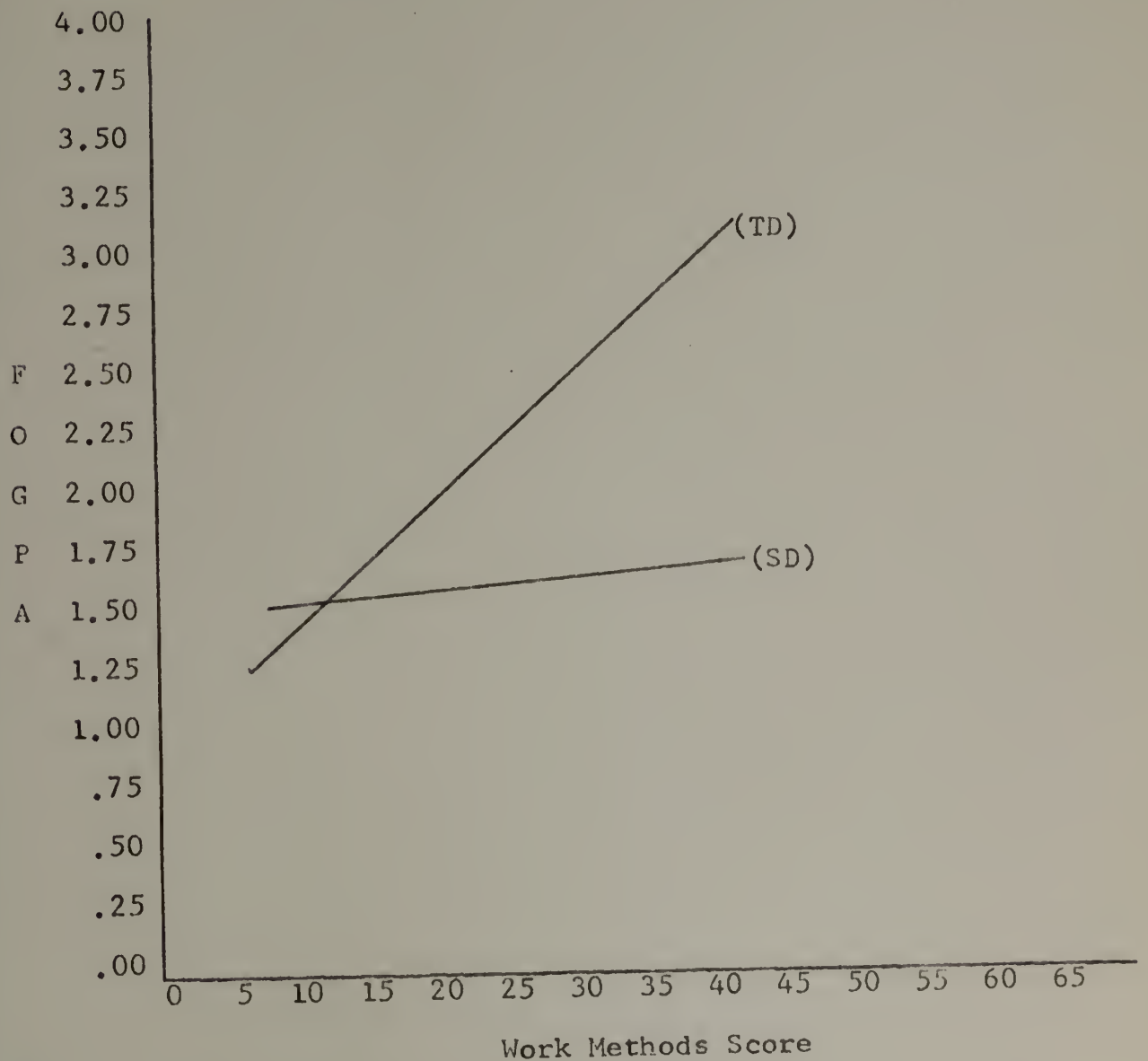
Regression Slopes with
Work Methods as Predictor
and Spring Overall GPA as Criterion Measure.
Student-Directed (N=32) vs. Teacher-Directed (N=26)



The end-points of the regression lines indicate the extreme scores on the aptitude variables for each treatment group.

Figure 8

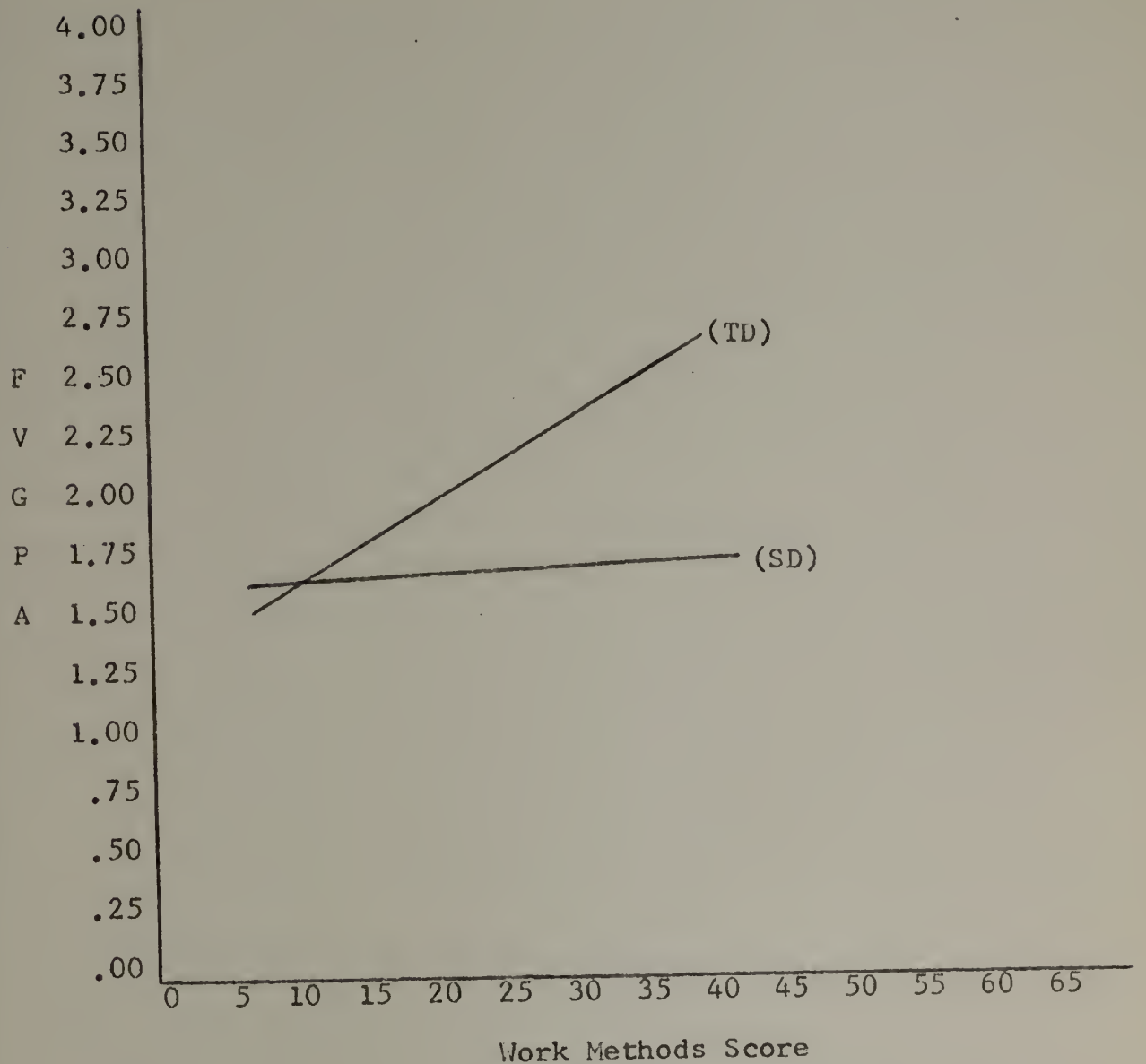
Regression Slopes with
Work Methods as Predictor
and Fall Overall GPA as Criterion Measure.
Student-Directed N=32) vs. Teacher-Directed (N=26)



The end-points of the regression lines indicate the extreme scores on the aptitude variables for each treatment group.

Figure 9

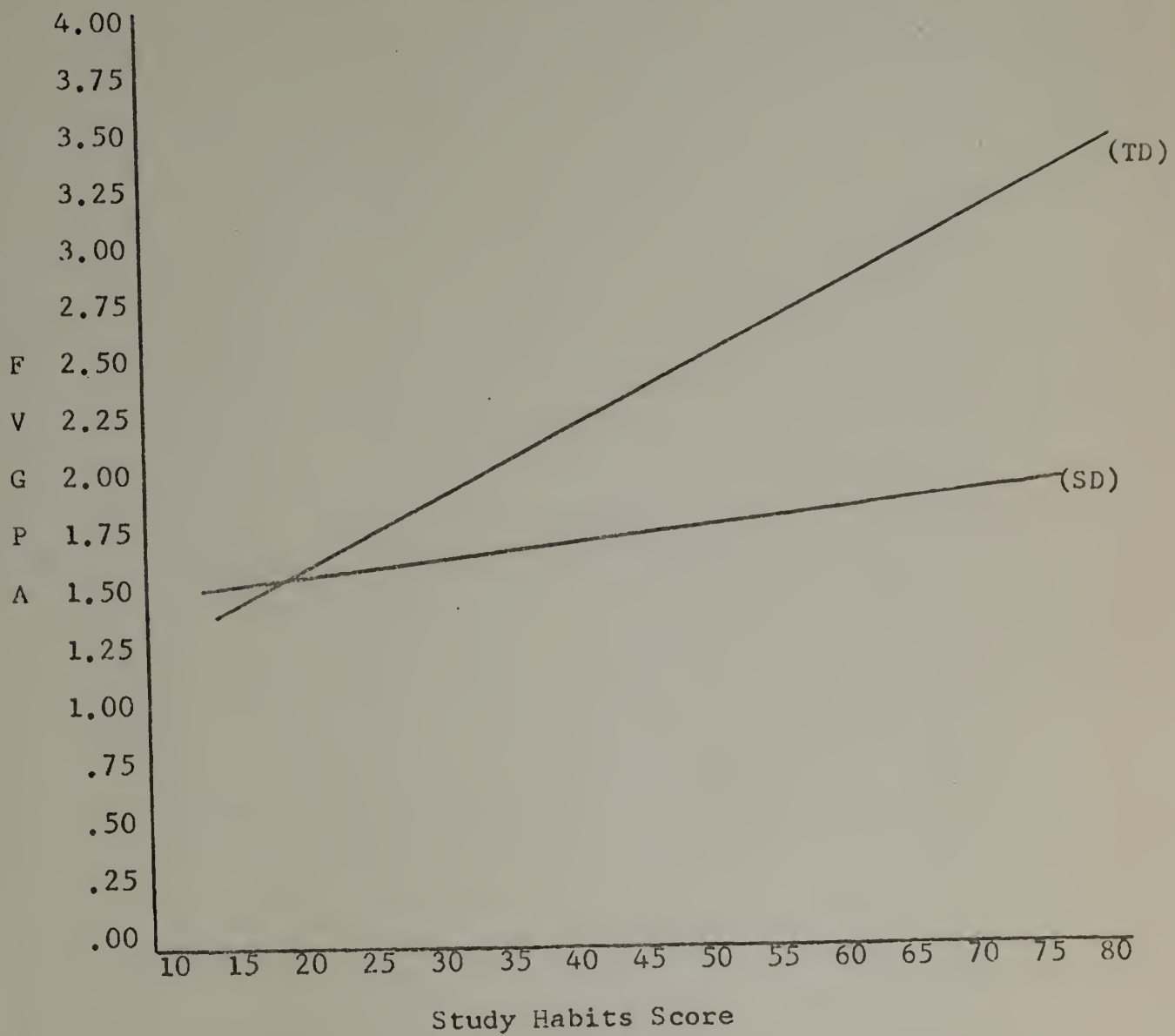
Regression Slopes with
Work Methods as Predictor
and Fall Verbal GPA as Criterion Measure.
Student-Directed (N=32) vs. Teacher-Directed (N=26)



The end-points of the regression lines indicate the extreme scores on the aptitude variables for each treatment group..

Figure 10

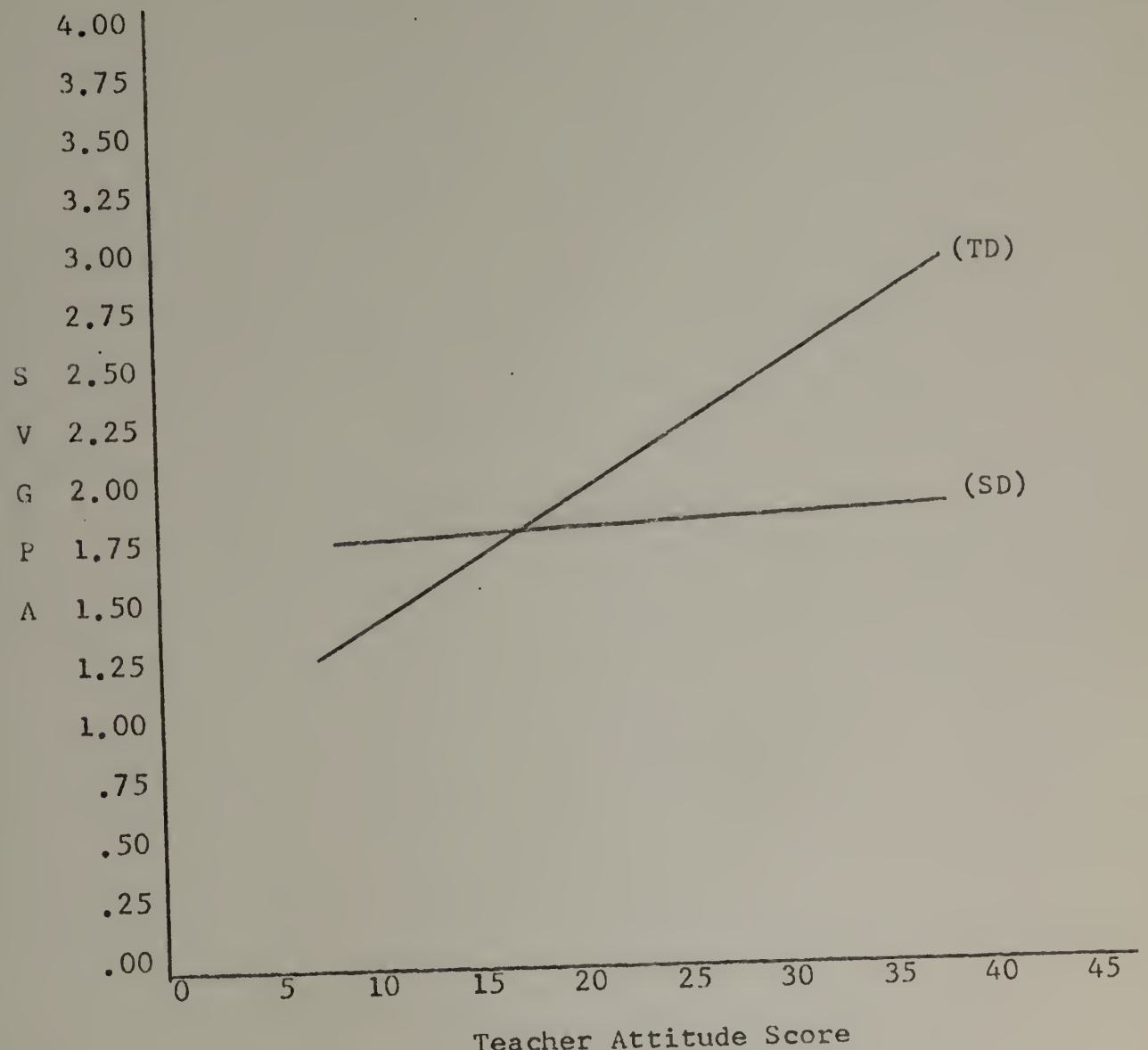
Regression Slopes with
Study Habits as Predictor
and Fall Verbal GPA as Criterion Measure.
Student-Directed (N=32) vs. Teacher-Directed (N=26)



The end-points of the regression lines indicate the extreme scores on the aptitude variables for each treatment group.

Figure 11

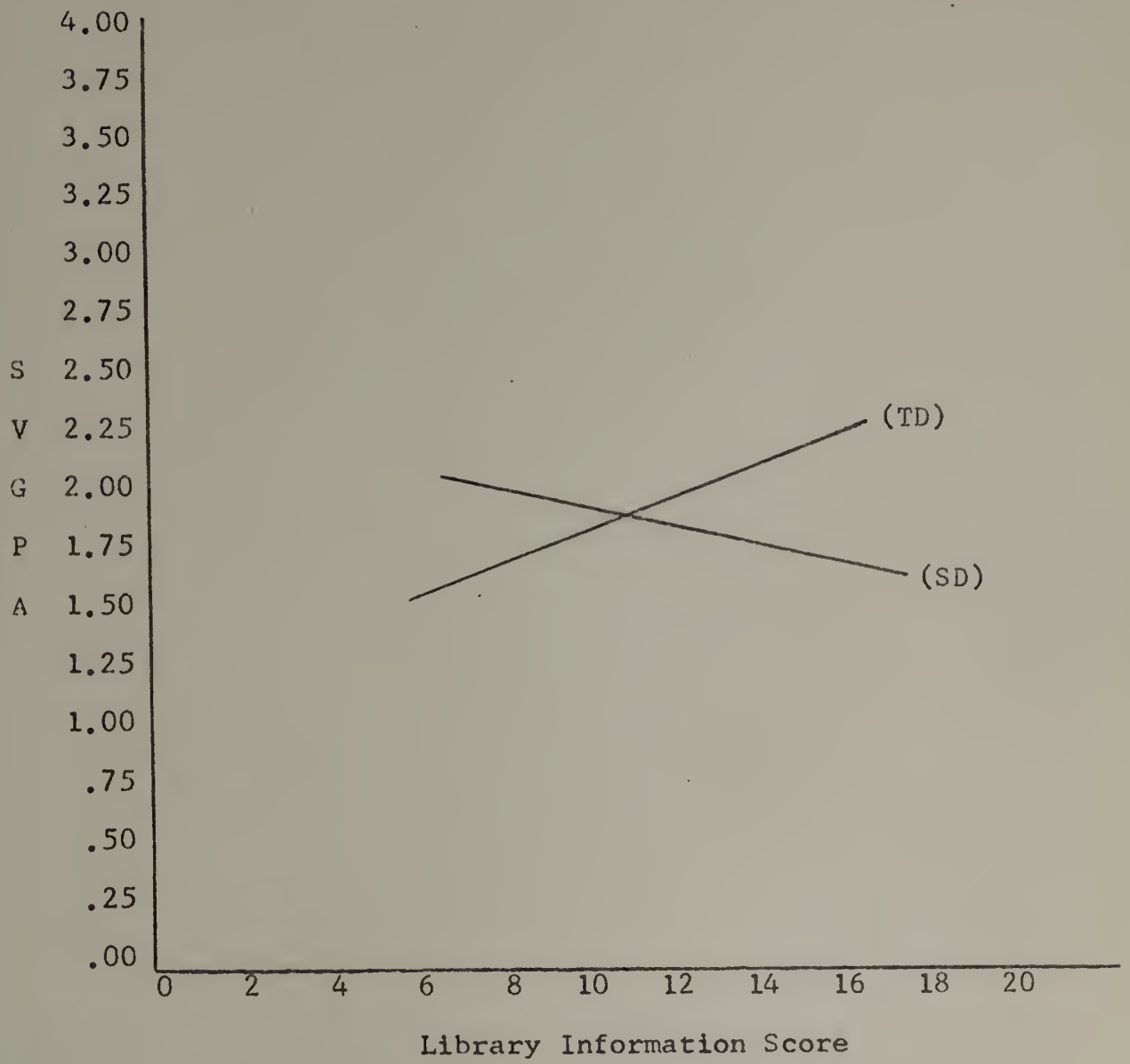
Regression Slopes with
Teacher Attitude as Predictor
and Spring Verbal GPA as Criterion Measure.
Student-Directed (N=32) vs. Teacher-Directed (N=26)



The end-points of the regression lines indicate the extreme scores on the aptitude variables for each treatment group.

Figure 12

Regression Slopes with
Library Information as Predictor
and Spring Verbal GPA as Criterion Measure.
Student-Directed (N=32) vs. Teacher-Directed (N=26)



The end-points of the regression lines indicate the extreme scores on the aptitude variables for each treatment group.

TABLE 9

Summary of Significant Non-Parallel Regression Slopes by Each Criterion Measure

Criterion	Variable	F
Fall Overall GPA	Taylor Manifest Anxiety Scale	4.05*
	Work Methods	4.47*
Fall Verbal GPA	Preferred Instructor Characteristics Scale	6.37*
	Study Orientation	4.37*
	Work Methods	4.39*
	Study Habits	4.81*
Spring Overall GPA	James Internal-External Scale	6.50*
	Work Methods	4.25*
Spring Verbal GPA	Preferred Instructor Characteristics Scale	5.36*
	Library Information	4.32*
	Teacher Attitude	4.49*

*$p < .05$
**$p < .01$

CHAPTER V

DISCUSSION AND CONCLUSIONS

The major purpose of this study was to relate individual differences among certain selected Suffolk University freshmen to their ability to succeed academically through a reading-study skills course which utilized (1) a teacher-directed approach and (2) a student-directed approach. A related purpose was to evaluate the overall effectiveness of the Suffolk University reading-study skills course.

Evaluations of College Reading Study Skills (CRSS) courses have produced inconsistent results, and studies comparing student-directed and teacher-directed methods have been inconclusive. One explanation for this may be that previous studies have been "main effect" studies which fail to identify the type of students who benefit from CRSS instruction and obscure the different effects that any one method has on students with different aptitudes. (Aptitude is defined as any characteristic of an individual that changes his probability of success in a given treatment.)

Several aptitudes or predictor variables were chosen to be studied. Both the Taylor Manifest Anxiety Scale and the James Internal-External Scale were selected because previous research seemed to indicate that these variables would interact significantly with the treatments utilized in this study. The Preferred Instructor Characteristics Scale was selected because, in the

opinion of the writer, it appeared to have the potential to interact significantly with the treatments.

The sample for the study consisted of 87 selected students from the 1971 freshman class of Suffolk University. Subjects were randomly assigned to one of the following: a teacher-directed CRSS class, a student-directed CRSS class, and a control group receiving no instruction. The groups were unaware of the experiment. Predictor variables were administered prior to any instruction. Overall and verbal GPA's for the Fall 1971 and Spring 1972 semesters were the criterion measures.

Hypothesis I

Selected freshman students who are required to participate in Suffolk University's College Reading-Study Skills Program will attain a significantly higher grade point average than similar students who are not required to participate.

The hypothesis was only partially supported. When Fall Verbal GPA was the criterion measure, the teacher-directed (TD) group's Verbal GPA was significantly higher than that of both the student-directed (SD) group and the control group. The hypothesis was not supported when the other three criterion measures (Fall Overall GPA, Spring Overall GPA, and Spring Verbal GPA) were considered. These results seem to indicate that the Suffolk University CRSS program had only a slight effect on producing significant improvement in the scholastic standing of its students.

The program was evaluated further by analyzing the experimental group's pre- and posttest scores on several reading and study skills tests. The groups made significant gain score

changes on several of the tests, but since these same scores were not available for the control group, it was impossible to conclude that the gains were the result of the experimental treatments. There were no significant differences between the experimental groups on the amount of gain made on the tests.

These results appear to support previous research which demonstrated that there is no positive relationship between participation in a CRSS program and GPA and that no single best method of teaching a CRSS course can be identified. But both previous research and this aspect of the present study failed to investigate the problem of relating students' individual differences to their ability to succeed with alternative treatments. This problem provided the impetus for the formulation of Hypotheses II, IIA, IIB, and IIC.

Hypothesis II

Certain selected variables will interact with college reading-study skills instructional treatments in reference to college success as measured by grade point average.

The hypothesis was supported. The tests for parallelism resulted in an interaction between several of the variables and one or more of the criterion measures. The Taylor Manifest Anxiety Scale (V4) and Work Methods (V21) interacted with the Fall Overall GPA criterion. The Preferred Instructor Characteristics Scale (V5), Study Orientation (V19), Work Methods (V21), and Study Habits (V22) interacted with the Fall Verbal GPA criterion. The James Internal-External Scale (V3) and Work Methods (V21) interacted with the Spring Overall GPA

criterion. Finally, the Preferred Instructor Characteristics Scale (V5), Library Information (V17), and Teacher Attitude (V23) interacted with the Spring Verbal GPA criterion.

Hypothesis IIA

In reference to scores on the Taylor Manifest Anxiety Scale, the higher a student scores, the more his learning will be facilitated by teacher-directed instruction and the lower a student scores, the more his learning will be facilitated by student-directed instruction.

The hypothesis was not supported. There were significant non-parallel regression slopes at the .05 level for the Fall Overall GPA criterion, but they were opposite to the predicted direction. For high-scoring students, learning was facilitated more by student-directed instruction and for low-scoring students, learning was facilitated more by teacher-directed instruction. The hypothesis was based on the results of the Dowaliby (1971) study which showed that students who scored high on the Taylor Manifest Anxiety Scale performed better in the student-centered mode of instruction and students who scored low performed better in the student-centered mode of instruction.

One explanation for the contradictory findings of the two studies may lie in the different interpretations of the terms "student-directed" and "student-centered" and the terms "teacher-directed" and "teacher-centered." Dowaliby's student-centered group, for example, followed a discussion format. The students were encouraged to address questions to either another student or the instructor. Student interaction was strongly encouraged by

the instructor. On the other hand, students comprising the student-directed group in the present study were encouraged to interact with the instructor on a one-to-one basis, but interaction between students was discouraged and rarely, if ever, took place during class time. Students worked independently on self-directing, self-correcting materials and occasionally conferred with the instructor regarding their progress.

The teacher-centered group in Dowaliby's study was provided with a lecture format. Student responses and interaction were discouraged; the instructor did not build upon student-initiated responses, even though a response might have been pertinent to the material being covered. In the present study, students comprising the teacher-directed group also were provided with lectures, but student responses and interaction were encouraged and the instructor built upon student-initiated responses.

Thus, it may be that Dowaliby's student-centered group was more comparable to the teacher-directed group in the present study and his teacher-centered group more comparable to the present study's student-directed group. It would seem, then, that this difference in the interpretation of terms might be one alternative explanation for the contradictory results of the two studies.

Hypothesis IIB

In reference to scores on the James Internal-External Scale, the more externally oriented a student scores, the more his learning will be facilitated by teacher-directed instruction and

the more internally oriented a student scores, the more his learning will be facilitated by student-directed instruction.

The hypothesis was not supported. There were significant non-parallel regression slopes at the .05 level for the Spring Overall GPA criterion, but they were opposite to the predicted direction. For externally-oriented students, learning was facilitated more by student-directed instruction and for internally-oriented students, learning was facilitated more by teacher-directed instruction.

One explanation for the regression slopes appearing opposite to the predicted direction may be that in the present study, the environment theoretically defined as "internal" in reality may have been perceived as "external" by the students and vice versa. Students in the student-directed group ("Internal Environment") had a large variety of self-directing, self-correcting, and programmed materials from which to choose. Although programmed materials allow a student to proceed at his own rate, they are highly structured and carefully worked out in advance by the author in a step-by-step progression with "correct" responses provided by the author. Students may have perceived such an environment as "external" rather than "internal" since, with the exception of the students proceeding at their own rate, the program is beyond their personal control with regard to the program's sequence and the interpretation and justification of "correct" responses.

On the other hand, textbooks, skills, and exercises in the teacher-directed group ("External Environment") were chosen by the instructor, but varied responses to questions were accepted and

students were encouraged to support their own alternative answers and interpretations. Students may have perceived that the interpretation and justification of "correct" responses were internally controlled or within their personal control. This discrepancy between the theoretical definition of an environment and the way in which the environment actually was perceived by students may be the major explanation for the slopes regressing in the direction opposite to that predicted in the hypothesis.

An additional explanation may lie in the differences in the population and criterion measures used in the Mathis study (upon which the hypothesis was based) and the present one. Mathis' population was ninth-grade students whose reading ability was within three grade levels of ninth grade and who expressed interest in participating in a reading improvement course. The population in the present study was comprised of college freshmen who scored below 460 on the verbal section of the Scholastic Aptitude Test, graduated in the bottom 60th percent of their high school class, and were required to enroll in a CRSS program.

Mathis used changes in the number of eye fixations, reading rate, and regressions as measured by the Reading Eye Camera as his criterion measure, a questionable method for evaluating a reading program. The present study used GPA as the criterion measure. While Mathis stated that students placed in a congruent learning environment did "appreciably better" than those placed in an incongruent learning environment, he failed to support his statement with results of a test to measure for significance of difference between groups.

Hypothesis IIC

In reference to the Preferred Instructor Characteristics Scale, the more a student prefers an affective type of instructor, the more his learning will be facilitated by teacher-directed instruction and the more a student prefers a cognitive type of instructor, the more his learning will be facilitated by student-directed instruction.

The hypothesis was supported. There were significant non-parallel regression slopes at the .05 level in relation to the Fall Verbal GPA and Spring Verbal GPA criteria. For the Fall Verbal GPA criterion, treatment differences were related only to low scores, or scores indicating preference for an affective instructor. The lower a student scored, or the more he preferred an affective instructor, the more his learning was facilitated by the teacher-directed method and less by the student-directed method. On the Spring Verbal GPA criterion, however, the higher a student scored, or the more he preferred a cognitive instructor, the more his learning was facilitated by student-directed instruction and the lower a student scored, or the more he preferred an affective instructor, the more his learning was facilitated by teacher-directed instruction.

These findings seem to suggest that if the Preferred Instructor Characteristics Scale is to interact with instructional treatments in future studies, the role of the instructor will be instrumental in differentiating the two methods. In the present study, for example, the instructor in the TD treatment encouraged student interaction and he attempted to establish a comfortable, friendly classroom atmosphere (affective instructor). In the SD

treatment the instructor did not encourage students to interact and he attempted to establish a task-oriented atmosphere. Teacher-student conferences usually dealt solely with the student's progress and his questions on the subject matter (cognitive instructor).

Other Interactions

Four of the scales (Study Orientation, Work Methods, Study Habits, and Teacher Attitude) from the Survey of Study Habits and Attitudes produced significant non-parallel regression slopes at the .05 level of significance. However, only high scores on these scales produced differences between the two treatment groups.

Study Orientation

When Fall Verbal GPA was the criterion, students who scored high on Study Orientation tended to attain a high GPA regardless of the type of instructional treatment. However, such students seemed to profit more from the TD approach than from the SD approach.

Work Methods

When Spring Overall GPA was the criterion measure, students who scored high on Work Methods tended to attain a high GPA regardless of the type of instructional treatment. However, such students seemed to profit considerably more from the TD approach than from the SD approach. Furthermore, when Fall Overall GPA and Fall Verbal GPA were the criterion measures, students scoring high on Work Methods seemed to profit only from the TD approach.

Study Habits

When Fall Verbal GPA was the criterion, students who scored high on Study Habits seemed to attain a high GPA regardless of the type of instructional treatment. Such students, however, seemed to profit considerably more from the TD approach than from the SD approach.

Teacher Attitude

When Fall Verbal GPA was the criterion, students scoring high on Teacher Attitude seemed to profit only from the TD approach.

It is likely that students who scored high on the aforementioned scales of the Survey of Study Habits and Attitudes did so because they had had favorable past experience in traditional educational settings similar to that of the TD instructional treatment. Such high-scoring students in the TD group may have attained higher GPA's than did similar students in the SD group because they felt more comfortable and secure with the familiar procedures that were carried out in the TD setting.

No ATI's were found for scores on the MHBSS Reading Test, the MHBSS Vocabulary Test, or the Nelson-Denny Reading Test. The only score from the MHBSS Study Skills Test that produced significant non-parallel regression slopes at the .05 level of significance was the Library Information score. With Spring Verbal GPA as the criterion, learning was facilitated more by the SD method for students scoring low and learning was facilitated more by the TD method for students scoring high. There appears to be no plausible explanation for this ATI.

Conclusions and Suggestions for Further Study

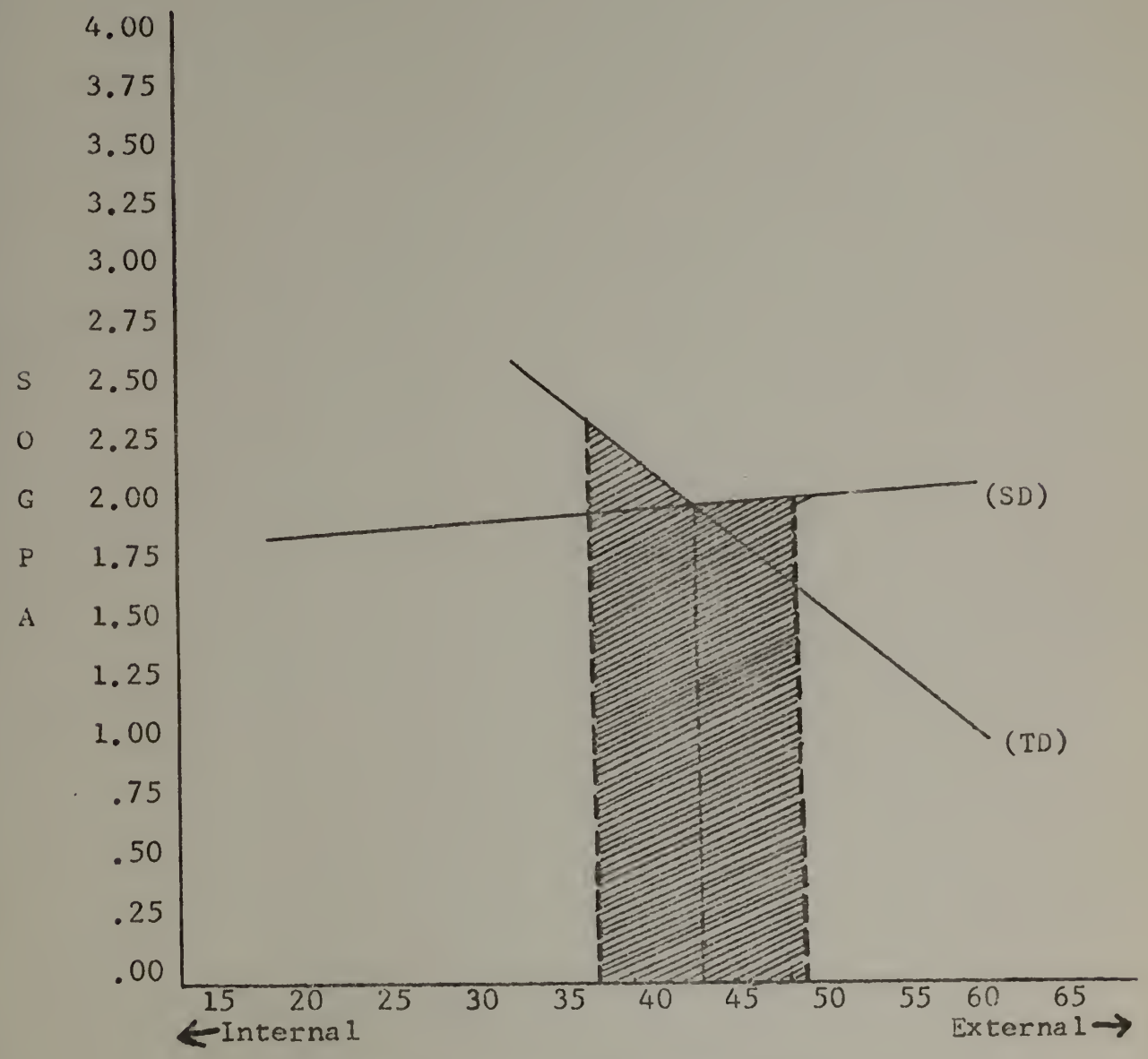
One conclusion of this study is that the Suffolk University CRSS program had only a slight effect on producing significant improvement in the scholastic standing of its students. However, a second conclusion, based on the ATI's found in this study, is that if alternative instructional treatments are provided for students with different aptitudes, a greater proportion of students required to enroll in Suffolk University's CRSS program should make scholastic improvement.

Before predictions can be made about precisely which students should be placed in alternative CRSS treatment groups, this study should be replicated using a larger sample and employing a procedure such as the Johnson-Neyman technique (Johnson and Neyman, 1936) which defines the regions or scores in which the treatments are significantly different. A hypothetical example is presented in Figure 13 with the James Internal-External Scale as the predictor and the Spring Overall GPA as the criterion. In predicting the optimum treatment, those students scoring below 37 on the scale should be assigned to the TD treatment and those students scoring above 49 should be assigned to the SD treatment. There is no significant difference for students whose scores fall between 37 and 49; therefore, for those students this particular scale could not be used to differentially predict an optimal treatment.

Further ATI research on CRSS programs with different aptitudes should be conducted. But, as the results of this study seem to indicate, the aptitudes should be chosen because they

Figure 13

A Hypothetical Example of the Johnson-Neyman Technique with James Internal-External Scale as Predictor and Spring Overall GPA as Criterion Measure. Student-Directed (N=32) vs. Teacher-Directed (N=26)



are differentially realted to the treatments used. After reviewing ATI studies, Dowaliby (1971) concluded that "A strong theoretical basis for the inclusion of particular variables in ATI studies is seen to be an essential component of studies resulting in significant ATI's /p. 107." In addition, researchers may want to combine variables in order to identify multivariant aptitudes to predict success in alternative CRSS treatments. It would seem that if a combination of aptitudes could be identified, the ability to predict success in alternative CRSS treatments would be strengthened.

ATI research appears to be needed on CRSS programs with other college populations, such as community and junior college students. Ninety-one percent of the community and junior colleges surveyed in 1964 had an "open door" admissions policy. The result has been that a large proportion of the student body is considered "high risk" and up to 75 percent of these students withdraw during their first year (Schenz, 1964). The community and junior colleges have responded to the problem by providing courses in basic reading and study skills. According to Goodwin (1971), over half of the community and junior colleges require "high risk" students to take a CRSS course. Evans and Dubois (1972) claim that the paucity of research on CRSS programs at the community and junior college level and the persistently high drop-out rate among students enrolled in remedial courses at this level "casts considerable doubt upon the effectiveness of the remedial programs now in effect /p. 407." It would appear that ATI research, with its potential for predicting optimal treatments for students with different aptitudes, could make a substantial contribution to lowering the

drop-out rate of "high risk" community and junior college students.

In summary, it was concluded that the Suffolk University CRSS program had only a slight effect on producing significant improvement in the scholastic standing of its students. However, it appears that if it is differentiated for various types of students, a greater proportion of them should make scholastic improvement.

Several aptitude measures, such as the Taylor Manifest Anxiety Scale, the Preferred Instructor Characteristics Scale, and the James Internal-External Scale, appear to be appropriate predictors for differentially assigning students required to enroll in Suffolk University's CRSS program to a student-directed or a teacher-directed treatment. However, before such assignments are made, this study should be replicated using a larger sample and employing a procedure such as the Johnson-Neyman technique which defines a region of non-significance.

Three suggestions for further ATI research on CRSS programs were made. The first was to investigate different aptitudes chosen on a priori theoretical grounds; the second was to combine variables in order to identify multivariant aptitudes to predict success in alternative CRSS treatments; and the third was to study CRSS programs for "high risk" students enrolled in the community and junior colleges.

APPENDIX A

INDEX TO THE SUFFOLK UNIVERSITY READING LABORATORY

The lists that follow are designed to help you locate in the Reading Laboratory the particular materials you can use to improve your reading-study skills. Based on the results of your diagnostic tests and/or your own felt needs, you should establish your areas of skill development needs. Then trun to the appropriate sections in the index and locate the references that explain the skill and, when appropriate, provide exercises to practice the skill. All practice exercises are self-directing and self-correcting. (Most books are either programmed or include answer keys to the practice exercises. Those references that require a separate answer key are marked with two asterisks. These answer keys will be made available to you.)

The index includes references in five general areas: Comprehension; Comprehension in Content Areas; Reading Rate; Study Skills; and Vocabulary. Each general area is subdivided into specific sub-skill areas. If a page reference is followed by a single asterisk, those pages include practice exercises as well as an explanation of the skill.

APPENDIX B

SUFFOLK UNIVERSITY READING LABORATORY
DIAGNOSTIC PROFILE

Name:_____ Section_____

INITIAL	%ile Rank	FINAL	%ile Rank
Reading Test (Total)	_____	Reading Test (Total)	_____
Rate (Easy)_____ WPM	_____	Rate (Easy)_____WPM	_____
Rate (Diff)_____ WPM	_____	Rate (Diff)_____WPM	_____
Flexibility	_____	Flexibility	_____
Retention	_____	Retention	_____
Skimming & Scanning	_____	Skimming & Scanning	_____
Paragraph Comp.	_____	Paragraph Comp.	_____
Main Idea /5		Main Idea /5	
Facts & Details /5		Facts & Details /5	
Science /5		Science /5	
Organization /5		Organization /5	
Critical Reading /5		Critical Reading /5	
Vocabulary	_____	Vocabulary	_____
Study Skills (Total)	_____	Study Skills (Total)	_____
Problem Solving	_____	Problem Solving	_____
Underlining	_____	Underlining	_____
Library Information	_____	Library Information	_____
Study Skills Info.	_____	Study Skills Info.	_____

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